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ABSTRACT

This document contains one paper on corporate issues, discussing ThinkQuest for Tomorrow's Teachers, and more than 100 papers on distance education from the SITE (Society for Information Technology & Teacher Education) 2002 conference. Topics covered include: improved communication through online discussion; assessing the readiness of distance learning students; delivery of World Wide Web-based distance education courses using Blackboard; defining the role of student involvement when teaching with technology; defining roles, developing courses, and overcoming myths in distance education; student perceptions of online courses; distance learning program review; design of student model centered Web-based adaptive learning system; teaching research methods online; facilitating online professional development; impediments to distance education on the learners' part; reaching teachers through distance education; asynchronous and synchronous conferencing tools; faculty attitudes toward distance education; motivating students with interactive Web-based learning; cognitive improvement for the knowledge management process; rhetorical approach to assessing online discussion; a centralized Web site to support distance learners; Web-based staff development for K-12 teachers; constructing the online learning community; Web-based, problem-based training materials; new Internet tools for facilitating scientific inquiry; students characteristics in online and traditional courses; a Web-based professional development system for teaching K-12 technology integration; European computer driving license online course; diversified instructional modality system for learning transfer; preparing teachers for active online learning environments; remote assessment method for deaf and hard-of-hearing online learners; electronic conferencing in the classroom; effectiveness of online instructional technologies for deaf and hard-of-hearing students; integrating multimedia and video streamed instruction into a deaf and hard-of-hearing classroom; synchronous, remote, Internet conferencing with deaf and hard-of-hearing

students; a planning strategy for online courses; fostering inquiry-based learning online; online educational technology leadership certification; learning in online and desktop video conferencing courses; Tennessee Board of Regents online degree program; sexual harassment training online; enriching online course conferencing; student empowerment through distance assessment; transforming distance education teacher preparation programs; establishing a learning community of media design and art schools; semi-automated evaluation services in distance education; rubric to encourage and assess student engagement in online course conferences; structuring distance education programs to enhance preservice teacher preparation; teaching online courses at the high school level; motivational strategies for Web-based instruction; multiplicity and flexibility as Web-based course design and implementation considerations; copyright and fair use; the ICT for teachers initiative in the United Kingdom; anchored collaborative inquiry; guiding assumptions of successful distance education; and a strategy for analyzing online communication. Most papers contain references. (MES)

Corporate. Distance Education (SITE 2002 Section)

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CORPORATE

ThinkQuest for Tomorrow's Teachers (T3): A Collaborative Approach to Infusing Technology in 21st-Century Curricula

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Abstract: ThinkQuest for Tomorrow's Teachers is a collaborative partnership among ThinkQuest®—a non-profit educational technology organization—and a consortium of teacher-preparation programs, K-12 schools, and businesses. It is supported in part by a catalyst grant from the U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT3) Program. Now in its second grant year, the T3 consortium includes 14 colleges from across the country. The consortium seeks to promote the practice of learner-centered, constructivist pedagogy in which education students, their higher-education faculty, and others are colleagues in the learning process. We envision teacher educators modeling a learning environment in which inquiry, exploration, and knowledge adaptation and creation are critical modes of learning.

Introduction

ThinkQuest for Tomorrow's Teachers (T3) brings a new approach to educational technology use and integration by creating a core group of trained and committed teacher-preparation faculty who, in collaboration with academic leadership and administration, can engage their students in the ThinkQuest "Guiding Partner Approach" to constructivist learning. By combining the practice of this student-centered pedagogy with a structural approach to curriculum-based and Internet-enriched activity design, the T3 program aims to provide an ideological basis for systemic change in education practices by emphasizing exploration, collaboration, and facilitation among teacher-education faculty, pre-service teachers, in-service teachers, and elementary and secondary students.

Program Components

The T3 program is grounded in several components that, taken together, comprise a holistic approach to the integration and use of digital and Internet technologies as tools in the teaching and learning process. First and foremost is the ThinkQuest *Guiding Partner Approach (GPA)*. The GPA consists primarily of two interwoven concepts: students and teachers as junior/senior colleagues in the learning process, and the use of flexible frameworks for instructional design (Harris 1998). The approach focuses on preparing technology-proficient teachers to collaborate with students on educational activities that greatly increase the probability of long-term learning. Critical to the GPA model are techniques for establishing an environment that will encourage and facilitate "elbow-to elbow" collaboration between teachers and students.

In conjunction with the GPA, the *ThinkQuest Pre-Service* program component brings teams of pre-service teachers, in-service teachers, and college faculty together to create (1) web-based educational resources for use by K-12 educators, and (2) online learning projects for K-12 students. The program also encourages pre-service and in-service teachers to simultaneously collaborate with teams of elementary and secondary students in creating meaningful, educational Web sites.

Publishing and dissemination are important goals not only of T3, but also of the overall (Federal) PT3 program. The *T3 Web site* (http://t3.thinkquest.org) is among the primary means of addressing this programmatic goal. The purpose of the site is to disseminate project information, including methodology, partner programs, student project results, discussions, research, reflective writing, evaluation information, and resources in the areas of technology and pedagogy.

Results To Date

The program completed its first year in May 2001. Five higher-education partners participated in at least one T3 training workshop. The GPA was adopted and used by 35 faculty members at the five sites in 2000-01, and over 80 pre-service teachers created web-based learning activities that were published at the T3 Web site. Many of the faculty worked directly with their pre-service teachers to create web resources that can be used with K-12 students or by other teacher-preparation programs. Evaluation results (CER 2001) suggest that over 70% of the pre-service teachers that participated in the program felt they were prepared to integrate technology into their classrooms in the future. In addition, several participating sites forged partnerships with K-12 schools to promote the GPA in classrooms.

At the beginning of the second grant year (Summer 2001), ten additional Schools, Colleges, and Departments of Education (SCDEs) were accepted as consortium partners. These partners represent a broad geographic and demographic diversity, which will test the program in the most authentic settings and among teacher educators who are not considered technology innovators. There are currently 14 teacher-preparation partners in the T3 program. Year 1 partners are Eastern Connecticut State University, City College of New York, Western Michigan University, and University of the Pacific. Year 2 partners are Barry University, Hampton University, Haskell Indian Nations University, New Mexico State University, Oakwood College, Prairie View A&M University, Southern Oregon University, Trinity International University, Turtle Mountain Community College, and University of Washington. A four-day, hands-on workshop in Indian Wells, CA, in Fall 2001 provided an opportunity for faculty leaders from both Year 1 and 2 partner sites to meet and exchange ideas. There is great enthusiasm and commitment among these partners, which form the catalytic core of the program's success to date.

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More than one hundred papers comprise the Distance Education section, this year. Selected from a significantly larger body of proposals, these reports, taken as a whole, illustrate the breadth and impact of distance education within the broad scope of educational practice. The programs for this section remind us once again that technology in education often means distance education, and that distance education means, primarily, Internet delivery. Nonetheless, the spectrum of papers illustrates a field of practice and scholarship that is emerging with great diversity and energy.

Within these presentations, there are initial reports of experience with distance education in many different disciplines and at several levels, from elementary school, through post-secondary instruction and lifelong professional development. Though the discovery of distance education remains a relatively constant theme in this section, the level of sophistication reported by the discoverers reminds us that skill levels of every practitioner, including those who have just begun, are being raised. "Reeducating the professor and the student: Lessons learned ... " illustrates the ways that distance education plays a significant role in the overall professional development of the professorate. One suspects that the continued contributions of organizations like *ISTE* to the expectations of professionalism in distance education have helped everyone, even those just beginning, incorporate technology considerations into an overall vision of professional practice.

Not all experience is naïve, however. "Faculty use of Blackboard ... at two mid-western universities" or "An online solution to educational technology leadership certification" illustrate that the research base is broad enough to include multi-institutional and regional data sources. "A framework for senior/community college partnership ... " and "Supporting partnerships and school improvement with collaborative learning... " describe the ways barriers fall between kinds of institutions, as well, when distance education concerns surface.

"Preparing teachers for digital distance education" and "Facilitating online professional development" illustrate a broad shift towards distance strategies for staff development. Throughout the papers, we are reminded that learning with technology is learning about technology. Likewise, papers such as "Teaming: A catalyst for transforming distance education teacher preparation programs" and "The use of open and distance education in facilitating change in managerial development: The Mexico experience" explore professional development functions that are plainly impossible without sophisticated distance education systems - and sophisticated education technology professionals to manage them.

Reports of new offerings illustrate that the field is growing in breadth. Many of the reports here demonstrate that it is growing in depth, as well. Distance education experience is beginning to serve as a crucible of theory development. It is apparent from "Semantic knowledge factory," "Establishing a learning community of media design and art schools," or "Teaching through tragedy ... " that theoretical innovation spans most, if not all, disciplines. "

This is the first year that the *Annual* has been able to feature a broad selection of papers that address the power and problems of distance education in reaching persons with disabilities. While those vital issues are addressed in other sections, "... A global infrastructure ... for the physically challenged" or "Design of student model centered Web based adaptive learning system" begin with distance education as media of learning for all students. Many papers, including "Synchronous remote Internet conferencing with deaf and hard-of-hearing students" and "Using Robolab software and Lego hardware to teach computing concepts to deaf and hard of hearing high school students" explore the power of distance education when sound is not enough.

"Different assessment methods for deaf and hearing on-line learners" reminds readers of the myriad considerations of assessment that distance settings provide. From the beginning "Assessing readi-

ness of distance learning students" to "Considerations in evaluating network-based learning systems," experience and techniques related to gathering or using data in distance settings is considered at every level from public schools to leisure learning. Significantly, the emphasis in assessment has moved from comparing distance to face-to-face instruction or supervised examinations. Now, researchers are gathering information and constructing theory related to the kinds of probes that are appropriate to distance learning, in itself, and are producing "A rubric to encourage and assess student engagement in online courses," or "A strategy for analyzing online communication," among many others.

Theory, indeed, is emerging from other areas than assessment. "Creating, implementing, and sustaining community in ... distance education" or "Asynchronous online discussions: facilitating critical thinking skills ... " describe learning outcomes, unique with distance education, that bespeak a view of social learning that is fundamentally different from most face-to-face instruction. "Action research on socio-constructivist pedagogy in Web-CT" or "The transformation, reform, and prospect of distance education in Taiwan" begin a long-needed discourse about distance education as both object and tool of social reconstruction theory.

Of course, curriculum and theory all rest, to some extent, on infrastructure and budget in technology-facilitated environments. Many papers, like "Diseño, elaboración y ejecución de cursos virtuales de bajo costo," and "Distance learning: Eliminating the digital divide" or "Delivery of Web based ... courses using a freeware version of Blackboard." Funding sources make up a significant part of the treatments of "The role the New Opportunities Fund ... has played in the UK," and "Establishment and improvement of the distance learning project at Inter-American University of Puerto Rico, Bayamón campus" describe knitting together institutional resources from many different institutions.

These hundred papers, taken together, reminds readers that distance education is neither a special environment for education, nor a special application of technology. Rather, the field is rapidly acquiring a theoretical structure, policy expectations, teaching or assessment strategies, and pedagogical conventions of a complete educational system. From first encounters to distance institutions, and workshops to comprehensive student services systems, distance education establishes or reveals new ways of teaching , reinforces old values of knowledge, and establishes communities of learners in ways that thrill us all. As you will find as you read this section, among the most thrilled are those authors who share with us all their adventure of discovery.

Improved Communication Through Online Discussion

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Abstract: An interactive, asynchronous forum makes an excellent alternative classroom for graduate learning. Earlier experience as a reader and writer do not suffice for maximizing the potential of the forum for higher-level learning based, in large measure, upon meaningful discussion. This paper shares the pragmatic, research-based experiences of graduate students who strived for better communication as co-moderators and participants in short, three-week online discussions.

Introduction

Technology has progressed to the point that most educated adults have access to and use the Internet. E-mail, instant messaging and chat rooms are some of the more popular tools. There is an unstated assumption that use of these tools prepares one for meaningful participation in online class discussions. Interactive online classes should not be chat rooms. Even in this hypermedia environment, online class discussion needs to be carefully structured and supervised if higher-level learning is to be attained.

Graduate Online Learning Courses

Although this paper addresses coursework at the doctoral level, the lessons learned herein can be applicable to the masters' level and even, in some cases, to undergraduate studies. Each three-credit doctoral course at the Graduate School of Computer and Information Science (GSCIS) at Nova Southeastern University (NSU) runs 22 weeks, beginning with 20 hours on campus during the first week. Because all students are gainfully employed and most have family responsibilities as well, terms are lengthened to allow for life events.

Following the proliferation of the World Wide Web, when Mosaic became Netscape, students requested courses in Internet-based learning. In summer 1998, we offered our first class in Online Learning Environments (OLE). It covered just about everything related to distance education and almost immediately, we learned that there was much more to this new phenomenon than could be addressed in a single course. Therefore, in winter 1999, Instruction Delivery Systems (IDS) was introduced. It took a while to delineate the territory of each course. At this time, OLE addresses distance learning programs and communications issues and IDS, teaching and learning online. A third course, Online Assessments and Measurements (OAM) is still in the design phase awaiting the hiring of a professor with extensive expertise in both educational technology and psychometrics.

Online Communication in the OLE Course

Asynchronous, online discussions make possible revisiting remarks that had formerly disappeared into air, reflecting on one's remarks and on those of others and, most important, thinking in a collaborative environment. It is difficult to separate the process of discussion from the process of teaching and learning. During the earlier iterations of the OLE course, discussion leaders kept morphing into classroom teachers, which caused discussion participants to assume the roles of learners in under-designed instructional processes.

Half of the summer 2001 OLE course was devoted to research and practice with online communication in round table discussions. Several readings were suggested to help participants get into the appropriate mindset. For example, Funaro and Montell (1999) present guidelines for using online discussion based

upon 12 pilot iterations of a forum as a communications tool as an embellishment of traditional classes. The greatest value of their work is the specificity of items provided for reflection and experimentation. Williams (1997) offers online moderator guidelines and community-building tips based upon the WELL (www.well.com), self-described as one of the world's most influential and cherished virtual gathering places. The WELL uses the term *host a conference* as we use the term *moderate a round-table discussion*. The reading cited by the largest number of students was Beaudin (1999) who identified various techniques recommended and used by online instructors for keeping online learners on topic during asynchronous discussion. In addition to the techniques, he discussed factors that affected their selection.

As teachers, we are aware that when a learning experience requires the cooperation of the learners, the success of the experience is uncertain. However, nothing can be learned in a vacuum and in order to practice one's moderating skills, one must have participants. Each student was required to co-mentor a distant scholarly discussion and to participate as a discussant in three others. The co-moderator route was chosen in order to maximize opportunities for online communication and to ensure that discussion were not brought to an abnormal end because of life events. Forty students participated in the 20-hour on-campus meeting in July 2001, 35 of whom completed the collaborative, distance learning experience that ended on December 6, 2001. On the few occasions that co-moderators disappeared before the discussion was conducted, other teams readily included the abandoned peer.

Two online classrooms (asynchronous interactive forums) served as learning spaces for the course. The nomenclature is simple: The **forum** is the greater entity such as the classroom, a **thread** is a discussion topic, a **message** is a new statement within a thread, and a **reply** is a response to a statement. Enrollment in a class entitles one to password-protected forum entry. Anyone may initiate a thread, message or reply. Everyone has edit privileges but only the professor may delete.

The General Forum (GF), served a variety of purposes. In traditional terms, it was the classroom where new learning began, open discussion ensued and assignments were presented, elaborated upon and questioned. There was a monthly communication thread and even a café for casual conversation. It was up and running from the first day of the term and provided immediate, meaningful opportunity for new students to become comfortable in a structured online learning environment. Posting to the GF was optional. Active participation's only reward was personal and professional growth.

The second forum, Round Tables (RT), was restricted to the research-based, practical experiences (discussions) and a single thread for discussion issues. All online round-table discussions were required to be relevant to some aspect of online learning. Each round-table discussion was initiated and completed within a specified three-week period. The first week was set aside for sign-up and reading of the linked documents. During the two remaining weeks, the co-moderators were charged with presenting discussion provoking questions and encouraging increasingly deep levels of response. At the conclusion of the third week, the co-moderators had a week to collaborate upon and post a summary message on the discussion thread. A copy was posted to the GF in the Conference Summary Thread.

At the on-campus meeting that preceded the online learning experience, students were given time to circulate, meet in small groups, and come up with topics of possible interest. Following that, the class convened as a group and responded to the different ideas. This experience was not a commitment but an opportunity to get a sense of general interest and appropriateness. It was also a very significant part of building the community that would continue working together online.

Performance Assessment of One's Own Experience

There is an enormous difference between memorizing theory and turning it into useful practice. Graduate students should take ownership for their learning processes but it is very hard to convince people that the ultimate objective is other than to please the instructor. The purpose of the round-table exercises was to provide each student with multiple opportunities to balance experience and research. A four-step process was identified:

1. Literature relevant to online communication had to be reviewed.
2. Moderating and co-moderating had to be experienced.
3. Participating in different discussion with different moderators had to be experienced.
4. The three parts had to be put together into a reflective process so that the end product became professional growth.

The remainder of this paper focuses on the reflections as presented by members of the class. Initials are used to identify the students and to protect their privacy at the same time.

RS: All of the forums began with an introduction of the moderators, participants, and forum topic. One provided photos where were helpful in connecting posted opinions and ideas with a face (Boettcher & Conrad, 1999).

JL: Communication improved as a sense of community began to develop. The inclusions of first names appearing in the actual postings of a discussion are a sign that communities are beginning to emerge (Poole, 2000). As these communities emerged discussions seemed to flow more smoothly and quickly. Classes begin to negotiate substantive issues, ideas, and concerns with others who had common interests and goals (Edens, 2000). With other classmates responding, students receive much more extensive feedback than could be provided by the professor or moderator alone (Levin, 1999).

BG: The four round tables in which I participated successfully implemented Beaudin's (1999) "best practices." Each round table provided introductory information regarding the selected topic, participation criteria, and discussion questions. Discussion summaries were posted at the end of each week of the session. The discussions were highly interactive, the topics were interesting, and the resulting knowledge-base was extensive. I believe the high quality of forum contributions was a direct result of well-formulated initial discussion questions along with mentor-supplied re-focusing questions (Beaudin, 1999) when appropriate. In addition, each round table narrative included the professional background and experience of the co-mentors. At the end of the registration week of each session, the photos of round table participants and co-mentors were posted. These activities demonstrate the importance of and adherence to the principle that discussion moderating takes place in both a professional and a social context (Collison, Elbaum, Haavind & Tinker, 2000; Rossman, 1999).

NT: Through the power of asynchronous dialogue, I was able to join the discussion whenever I was best cognitively suited to do so (Abramson, 1999). I had enough time to decide how best to respond and which individual I wanted to direct my response to, in order to make the best possible contribution to the discussion (Funaro & Montell, 1999). I learned more than I thought I would from my peer's knowledge, opinions, remarks, questions, and experience. My peers were very respectful of each other, and they made an effort to understand alternative viewpoints (Poole, 2000).

JP: In retrospect, I learned tremendously from this experience. Although I have participated in a variety of online discussions, from a state-wide online conferences to daily distance education interaction with students, this exercise in mentoring illuminated more than just the admiration of best practices as mentioned above. Specifically I noted seven distinct lessons learned: Nothing takes place in a vacuum. Ask good questions. Listen actively. Involve everyone. Be flexible. Dare to venture into unknown territory. Relax.

SV: Moderators of online discussions should clearly define the topic for a discussion. Knowlton and Knowlton (2001) and Fabos and Young (2000) suggest that both the quality of communication and the interest level of participants deteriorate when moderators do not clearly solidify the scope of a discussion. In each of the round table discussions for this course, the initial postings made by moderators in week one included purpose statements about the session topics. Another successful strategy employed by the round table moderators was the use of leading questions posed by moderators in their opening postings. Discussions generally initiated with replies to these questions.

SS: Studies have shown that online forum participants want prompt feedback and specific comments posted in a timely fashion (Rossman, 1999). In preparing responses as the moderator, I was challenged to

differentiate between participating and encouraging, steering and monopolizing. Rossman observed that online courses are not conducive to lecturing and that instructors who facilitate learners' mastery of course objectives by encouraging discussion of topics related to the assigned reading are typically more effective than those who post lengthy presentations. Keeping this in mind, our moderator team encouraged short three to four paragraph discussions. In responding, we limited ourselves to add-on information rather than creating mini-essays. If I felt I might be lecturing, I reviewed my posting and changed some of my statements to questions rather than giving or creating answers.

PF: I serendipitously tripped across Dehler and Possas-Hernandez (1998) who reflect the positions espoused by Dr. Abramson. They aver that computer-mediated communications (like our forums) provide a fertile medium in which to cultivate the construction of knowledge, both shared and individual. Also, that experiential learning contributes to the full mastery of a domain. They conclude that the depth and richness of the learning experience depends on collaboration, diversity, and multiple perspectives. This mirrors my experience in this exploration of online discussion via the forums in our class.

BG: As I reflect on the "round table" assignment of this course, I am impressed with the completeness and the holistic appeal of this assignment. As learners, we had the opportunity to observe and experience the "best practices" of forum moderation modeled effectively in the general forums; each of us was able to participate in four student-forums (once as a co-moderator and three times as a participant); and finally we reflected on our experiences. As a teacher in a traditional classroom, I am constantly challenged to design class activities that effectively promote learning (the assimilation, integration, and implementation) of the concepts and principles under study. I found this assignment to be an extremely effective activity. This assignment was carefully crafted and exceptionally constructed in order to promote a rich educational environment for all of us.

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Assessing the Readiness of Distance Learning Students

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Abstract: Is distance learning appropriate for all learners? How does a learner know if it is an appropriate choice? To assist students in determining their level of readiness to study at a distance and to assist institutions in identifying students who might be at risk of not succeeding in an online enviroment, an online assessment device has been constructed. **READI**–Readiness for **E**ducation **A**t a **D**istance **I**ndicator is a tool to help learners and their advisors assess the student's readiness for learning at a distance. The READI tool is not intended to make an absolute decision as to whether or not a student will succeed as an online learner. However, the student's scores will give them an idea of their strengths in the four different components READI measures: reading comprehension, technical competency, individual attributes and learning styles. When the student uses the READI tool, they receive immediate feedback concerning their scores along with a guide to interpretation. In this presentation the presenter will share how this tool is being used by Troy State University as well as other institutions to assess learner readiness.

Are you ready to take a distance-learning course? Are your distance education students best prepared to learn at a distance? Is distance learning for you?

Emerging advances in instructional technology, particularly the Internet, have caused higher education institutions to re-consider how they deliver courses and use space. This paradigm shift from a classroom model to a technology-delivered model has particular significance for distance learning. There is a group of learners who, due to work, family commitments, disability, or geographical location, are unable to attend campus and therefore choose to study at a distance. This application of instructional technology has resulted in a world-wide explosion of on-line courses. **But is distance learning appropriate for all learners? How does a learner know if it is their best choice?**

Having worked in distance learning for over a decade I have observed that distance learning is congruent with the needs and talents of many students, but is not appropriate for others. As Dean of Distance Learning at Troy State University Montgomery I developed a tool I call **READI**–Readiness for **E**ducation **A**t a **D**istance **I**ndicator. READI is a tool to help learners and their advisors assess the student's readiness for learning at a distance. The READI tool is not intended to make an absolute decision as to whether or not a student will succeed as an online learner. However, the student's scores will give them an idea of their strengths in the different components READI measures. When the student uses the READI tool, they receive immediate feedback concerning their scores along with a guide to interpretation.

In this presentation I will share how this tool is being used by Troy State University as well as other institutions to assess learner readiness.

READI measures four components:

- Reading Comprehension
- Technical Competency
- Individual Attributes
- Learning Styles

Geoffrey Cox (Cox, 2000) noted that Stanford has been doing forms of distance learning for more than 30 years. He observed that "Data drawn from these programs show that distance education works. We know from substantial experience that under the right conditions, not only is distance education comparable in quality to traditional education, but in some cases it is more effective. The conditions are important: students must be ***capable***, highly ***motivated***, and ***familiar*** with enough background to be ready to receive new ideas and knowledge. They must have good **coaching**, though not necessarily teaching, they must have the opportunity to interact with each other. When these conditions are met, learning takes place." Cox's comments mirror the four measurable components of READI:

Capable – Reading comprehension
Motivated – Individual attributes
Familiar – Technology competency
Coaching – Learning styles

How READI Works

The web-based tool assesses students' likelihood for succeeding in an online learning program. READI indicates the degree to which an individual student possesses attributes that contribute to success in online learning, including:

- Self-motivation
- Time-management skills
- Self-discipline
- Reading comprehension
- Persistence
- Availability of time
- Ability to use a laptop, printer, software, and the Internet.

READI does not rely on simple self-assessment questions with obvious "right" and "wrong" answers. Rather, through a sequence of activities measures the degree to which students possess the traits needed for success in studying at a distance. READI provides an immediate score and diagnostic interpretation of results to the student and to their prospective school.

Benefits to the Educational Institution

The literature shows that maintaining high retention rates in distance education programs is a significant challenge for distance learning program. One of the significant variables is student readiness and appropriateness for studying at a distance. READI serves as an early warning device to identify students that might be at-risk of dropping out of distance education programs.

Educational institutions invest heavily on attracting and recruiting students. But when students quickly drop out of the program there is little return on the investment. READI allows schools to identify the students who are likely to drop out and it then provides resources for remediation so that the student can succeed.

Benefits to the Student

Students also invest thousands of dollars in their education. Many of them are hesitant to study at a distance for fear that they might not do well. READI helps them to recognize their strengths and provides resources to strengthen their weaknesses. A student who is confident of their READIness is much more likely to enroll.

Other Features of READI

Reporting – Each participant receives an individualized report indicating their personal READI score. This report compares their results to others in their defined group. School counselors receive a summative report detailing overall usage as well as individual READI scores.

Solutions – If the instrument determines that a user is not ready to study at a distance, links to potential solutions and resources are provided. At this point the student's admissions counselor may also provide additional resources.

Ease of Interpretation – The results are not presented in confusing columns of numbers and figures, but in easy to interpret charts and graphs. Participants receive colorful charts indicating their level of READIness in reading comprehension, technical competency, individual attributes, and preferred learning styles.

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Delivery of web-based and web supported distance education courses using a freeware version of Blackboard

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Abstract: Delivery of distance education courses can be challenging in terms of timely delivery of course materials and instruction. Another challenge is facilitating student communication within student groups and with faculty. By providing material and exercises prior to class and conducting virtual classroom/synchronous webchats, web-based distance courses can be more interactive for students and help to facilitate critical thinking and problem-solving skills. A free web-based instructional delivery method, Blackboard Version 5.0, can meet many of these needs. This electronic instructional delivery method eliminates the time and expense of mailing or sending materials by facsimile. This system can also be used for administration of quizzes within specified time frames, and immediate feedback can be delivered to the student and instructor. Virtual office hours can be conducted via the webchat/virtual classroom feature and there is also a link to external email. External links to recommended websites can be used for additional reading resources. Use of Blackboard provides many benefits that can allow for efficient delivery of distance education courses within the confines of budget guidelines, particularly when distance education is new to the educational institution.

Introduction

Post-secondary education perspectives have changed over the past few decades. Changes include shifts in enrollment patterns, changing demographics of students and faculty and greater demand for anytime/anywhere learning. Fulltime resident student enrollment is declining in many educational programs. More students are adult learners that want to advance their present positions and require advanced education and training. However, many of these students are unable to accept fulltime or daytime pedagogical roles due to the need to remain employed in the community in which they reside. Predictions of the number of students desiring post-secondary education by the year 2005 is a 20% increase from current numbers. Many students, however, will expect anytime/anywhere learning to meet their educational needs. Employment expertise will often require better communication and problem-solving skills. Meanwhile, shifting of faculty responsibilities may require more time devoted to teaching during non-traditional hours as they meet these enrollment needs. More frequently, institutions are investing in computer technology and distance education to meets these needs rather than on classrooms.

Converting courses to distance education does require some thought and re-design. One can not merely post the lecture notes and exercises, give periodic examinations and expect the majority of students to succeed in mastering the skills they need to acquire. This didactic approach is successful in developing critical thinking in only a few students who have previously acquired proficiency. Problem-solving must be taught through a variety of methods and using the computer as a delivery tool will not automatically teach these skills. In fact, using the computer as a delivery method may create more barriers than by using face-to-face demagogical practices. Professors need to become designers of learning experiences, especially when using the computer as the delivery tool. Likewise, care in instructional design must be taken so that the product is not full of "bells and whistles" that are distracting and don't add to the value of

the education. Learning experiences should involve guided practice with feedback, case study or other problem-solving exercises and directions in gathering and using information.

A sense of community is missing with distance education in that students usually lack the face-to-face communication with other students and the instructor. If students also fail to receive feedback for the mastery of skills and knowledge in the course, they become discouraged and drop the course or the entire program. Likewise, if students experience difficulty using the technology and a sense that they are the only one experiencing problems, they will drop out. Students expect a seamless online environment that unifies student life and academics. Using discussion board, email, homepages, an online calendar and instant messaging can all help to create a sense of the academic community and to form networks with faculty and other students in order to resist attrition.

Features of Blackboard

Blackboard Version 5.0, can meet many of these needs to include: course creation, student enrollment, student/faculty email, bulletin board and virtual classroom usage, storage and retrieval of syllabus, lecture handouts and assignments, quizzes, grade book and use of other tools. This system is user friendly for faculty and students. Easy to use tools allow for the delivery of materials (text documents or slide shows) to distance students over the internet in many formats including but not limited to html. This electronic delivery method eliminates the time and expense of mailing or sending materials by facsimile. Case studies can be posted on the discussion board and students can collaborate to solve the problems via email or webchat. Guided practice can facilitate critical thinking with synchronized chat using the white board to illustrate points and bring in internet sites during virtual classroom time. Blackboard can also be used for administration of exams within specified time frames, and immediate feedback can be delivered to the student and instructor. Productivity tools are also provided to allow the student to have an address book and an online calendar to track their tasks. Other tools allow students to search for other courses provided on Blackboard and access resources such as online searches.

Communication Challenges

Challenges faced in the conversion of classroom-based courses to web-based involve communication. A common cause of attrition in distance education is due to students feeling isolated from the instructor and other students. Including opportunities to chat with the student at a distance and mechanisms for quick feedback via email or instantaneous feedback via instant messages can improve communication and help students to stay motivated and be successful in learning. Blackboard provides these features and the virtual classroom can be subdivided into separate rooms for small chats and private conversations between the instructor and one student even within a virtual classroom setting. Virtual office hours can be conducted via the virtual classroom feature and link to external email can provide communication when synchronous messaging is not necessary. By linking with a previously established email system rather than providing an internal email, it limits the number of communication tools that an instructor and student use.

Summary

Demands for distance education continues to rise. The delivery of distance education courses can be challenging in terms of timely delivery of course materials, didactic instruction and for facilitating student communication within student groups and with faculty. Blackboard 5.0 as a course-delivery system, is user friendly for both faculty and students with easy to use tools allowing for the delivery of materials over the internet in many formats including but not limited to html. This electronic delivery method eliminates the time and expense of delivering teaching materials and examinations via the mail or facsimile and can facilitate better communication between faculty and students in order to help decrease attrition that is typical of distance education.

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Prosocial Behavior in Online Instruction

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Abstract

A significant body of literature has supported the assertion that communication in the classroom is central to the learning process. Prosocial behaviors, such as nonverbal and verbal immediacy, have been found to promote affective and cognitive learning in traditional instructional settings. The short paper presents the results of a study that examined the effects of instructor verbal immediacy on affective and cognitive learning in the online classroom. The results of this study found that students who rated their instructors as more verbally immediate expressed greater positive affect and higher perceived cognition than students taught by less immediate instructors. These results are consistent with similar studies in traditional courses and reinforce the influential role of the instructor in the online learning environment.

An understanding of the significance of prosocial behaviors in the online classroom has benefits to instructor and student alike, as practitioners could improve their course development and delivery in light of these results. Furthermore, such information goes beyond the "no significant difference" studies that continue to appear in the literature and would serve to validate an intuitive perspective held by many online instructors. Therefore, this presentation will not merely address the results of the study but will use them as a framework to suggest improvements to online pedagogy. Building upon these results, I will offer suggestions as to how to improve the effectiveness of the online learning experience through instructional design, pedagogical strategy, and social facilitation. This presentation will weave my experience, as both an online instructor and distance learner, with the results of the study to assist those who seek to effectively teach online.

Defining the Role of Student Involvement When Teaching with Technology: The Non-Traditional College Student

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In the process of defining the role of student involvement when teaching with technology, one must have an understanding of the student's needs. In the realm of higher education, we teach with a focus on both the traditional and non-traditional college student. The traditional college student is between the ages of 18-21, and in the midst of acquiring social and academic maturity, and a basic knowledge of the power, impact, and basic capabilities of technology on today's world. The range of technological knowledge of the traditional student varies between Internet surfing and chatting to demonstrating proficiency using highly technical processes. This proficiency will continue to increase in the traditional student, as K-12 schools continue to enhance, encourage, and advocate technology in the classroom setting. The non-traditional college student (approximately 40 years old) tends to be highly motivated and task-oriented due to the seriousness and circumstances of voluntarily enrolling in college. These circumstances entail real costs to the student such as time, employment, family, and finances. Most non-traditional students know a great deal about life, relations, and dealing with a wide range of experiences. A goal in education today is to meet the needs of all students, both traditional and non-traditional.

As we attempt to meet the needs of all students, we can find commonalities among the traditional and non-traditional student. Many times the needs of the traditional student include structure, guidance, and understanding throughout the student's college experience. Ironically, the non-traditional student possesses these same needs, but simply for different reasons. Common expectations of both kinds of students include information that is up-to-date, courses that are flexible and that accommodate different learning styles, guidance on what and how to study, opportunities for application, feedback, humor in the learning environment, and variety in course activities (Moore and Kearsley, 1996). Another common driving force for both the traditional and non-traditional student is the desire to graduate with a degree that will serve the student well in an ever changing world. Suggestions for direct student involvement that help to promote a high-quality educational program as students prepare for the real world may include such ideas as a teaching and learning center for multi-media training, a writing lab, laptops for students, and student involvement in the remodeling, networking, construction, and implementation of projects. Another method of meeting these needs, demands, and expectations is through distant learning course work.

In the process of making this transition to distant learning programs, institutions tend to grapple with various issues. The overall goal is to deliver a successful, high-quality education to students. Institutions inquire about the role of the student in the process, since the goal of a high-quality education centers around the student, both traditional and non-traditional. This includes a design or perhaps, redesign of what students bring to the "table of learning". For example, the once passive learner is required to become an active, autonomous developer of knowledge (Parker, 1997). Far more responsibility is placed on the learner and the classroom moves from a teacher-centered approach to a student-centered approach. As the approach changes, the task becomes multidimensional by a change in attitude, skills, and the ability to interact with the technology.

Kasworm (1992) suggests three stages in the continuum for implementing a student-centered approach for student success in technological course work. Stage One centers on teacher-directed interaction, which is highly structured, as students are introduced to the technology. Brief question and answer sessions are encouraged in order to assure pedagogical and social attributes as the student moves in the direction of autonomy.

Stage One allows interactivity in many formats including teleconferencing, videos, or conference calls. The goal is for the student to become self-directed through in-depth discussions that are richly sculptured by the professor.

Stage Two addresses student skills, as the learner advances from lower level thinking skills to higher order skills. The professor assists in guiding the student away from reliance on the instructor to the role of decision maker. McGiven (1994) believes that in order to promote a successful distance-learning program, one must focus on the student's ability to critically analyze and interpret information, and to interact and elaborate on concepts.

Stage Three, the final stage of a successful technological program, centers on high student autonomy and low instructor dominance. The professor's role is that of a guide and facilitator, while the role of the student is that of an active learner and participant. The professor continues to encourage and guide the student throughout the course.

All of these stages were part of the vital planning in creating an Educational Psychology course for 15 non-traditional education majors. These students displayed typical qualities of the non-traditional student, especially in

the lack of confidence when faced with a distance-learning course in their program of study. In order to make this experience a successful course, initial professor-directed activities were built in to the scheduling of the progression of the course and assignments. These students were a formed cohort and had taken in-class courses together prior to the distance-learning course. They were able to associate a name with a face and personality throughout the online discussions. Three face-to-face meetings were built into the course, including an initial, introductory meeting, a mid-term exam and review time, and a final exam and assessment time of both the course work and the distance learning experience itself.

Initial attitudes about the course arrangements ranged from excitement and high motivation to learn in a new and different manner, to real doubt and lack of confidence in each individual's ability in the realm of technology. The course was purposely set up to begin as a highly teacher-centered and directed course and to gradually transform into a student-centered format. This was accomplished predominately through the use of online discussion forums and changing from professor directed questions to student directed topics and discussions based on the readings.

The course turned out to be successful in many ways. All 15 students responded in all assignments and made A's and B's in the course work. Perhaps the biggest success in the course was displayed through the confidence of the students in their final remarks such as, "I can't believe I made it through this course. I knew so little about technology, computers, and especially a distance learning course!" Others remarked about how much fun the course had become, and still others who were reluctant to speak out in class felt proud that they were able to vocalize opinions on an equal level with more assertive students! All students commented on how convenient this sort of arrangement was for their typical non-traditional student schedules. All 15 students balance such responsibilities as full-time/part-time jobs, families, and adult responsibilities. As they responded to assignments and to each other, the recorded time of student involvement was usually around 10:30 P.M. to 1:00 A.M. This proved to be a real plus for the students, as they attempted to balance everything in their busy lives.

Overall, this distance-learning course proved to be a real success, but I attribute the success to following McGiven's general guidelines for creating a course that advances from a teacher-centered atmosphere to one that is almost completely student-centered. I also feel that the preset meetings and the fact that the students already knew each other through previous course work helped to create a free environment for genuine responses and feedback regarding individual opinions and spontaneity in the online discussions. For example, one student summed up the experience by stating, " Our discussions online were much like those we have in class, and knowing the people you are participating with is a tremendous help. I liked reading everyone's ideas and feel that I came away from the class with a great deal more understanding than I would have had I only read the materials and taken the tests."

Due to the changing needs and roles of students, changing approaches in education help to foster a student-centered process of learning for both the traditional and non-traditional student. As demonstrated in this particular online distance-learning course, the role of the student focuses on technology proficiency and responsibility for acquiring new knowledge.

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Mission Impossible? Defining Roles, Developing Courses and Overcoming Myths in Distance Education

Submitted by Bob Boston

New Mexico Tech is a small (1,500 students), state sponsored research university in central New Mexico. It sits on a traditional campus offering specialized classes in science and technology in the traditional manner. But with competition increasing in recruiting qualified freshmen, transfer students and graduate students, something non-traditional was going to have to be done: distance education.

History

Distance education was not necessarily a new idea. But implementing a viable program was. Over the years distance education became the longest four letter word on campus. Distance education would take time and money, resources that were better spent on research or other projects.

There were many failed attempts at distance education over the past years. Committees were organized and disbanded. Facilities were built using surplus materials, and consortiums were organized as delivery partners. Tech was doing distance education, but was missing the drive and support needed to take the next step. There was no reason to the programming, no reason for the classes offered, and no direction. Instructors saw distance education as time prohibitive. There was a question as to who would own the program rights. And there was little incentive monetarily and professionally for developing any type of program. There was also no marketing. There were no classes to market, and therefore no market for classes. Distance education had become mission impossible.

Developing a Concept of Distance Education

As other universities became more competitive, and as enrollment dropped, the university realized it was time to look at distance education once again. But even though distance education seemed to have many of the answers, there were still many hurdles from the past to overcome. For starters, there was no administrative organization. There was no superstructure. And there was still a concern from the faculty about workload and ownership. And since Tech was so far behind other universities in delivering distance education programming, it did not make since to try and compete against already established classes such as English and other undergraduate type programs. Besides, Tech has a unique blend of classes and programs, many of which are not offered anywhere else. Therefore, the university began to take inventory and identify classes and programs that were not only unique to Tech, but would create interest beyond the campus. The concepts identified came from energetic materials, mineral engineering, and science teaching, areas of which unique classes could be developed and offered.

Next, a team of distance education visionaries was put into place to create a department for distance education. This team went to work identifying markets, researching cost-effective delivery methods, developing infrastructure, establishing policies and procedures and contemplating non-traditional calendars to meet the needs of students. A decision was made to market programs and not just classes. The team set out to do public relations work with the faculty. They had to identify and address the concerns of the faculty and convince them of the benefits of distance education. This has been done by the establishment of committees, holding facility open houses, regular reports to the faculty council, and the writing of a distance education contract with the input of faculty members that is favorable in areas of compensation and assistance in course development. As programming develops, as quality improves, and as other faculty members see what distance education is doing for other programs and the university, attitudes are changing and more and more individuals and departments are wanting to participate.

Distance Education Takes Shape

Distance education at Tech is still in its infancy. There are still many questions and concerns that need answered. Distance education at Tech is growing faster than ever. There are growing pains. Unforeseen problems arise almost daily, but with teamwork and vision they are mostly resolved. The organization is developing and team members are identifying their roles. But despite the growing pains, distance education is becoming a viable program and is beginning to meet the needs of students, community and the university. Today, New Mexico Tech is producing and delivering courses using video tape, video teleconferencing, and the internet in real time to sites all over the country. Today it is possible to earn a Master's degree at Tech through distance education. And distance education at Tech will continue to grow as more plans and programs begin to take shape. The vision of distance education at New Mexico Tech is gaining life. It has allowed the university to reach beyond its physical boundaries. Distance education is no longer Mission Impossible, it is quickly becoming Mission Possible.

Student Perceptions of Austin Peay State University Online Courses

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Abstract

Austin Peay State University began offering online courses in Fall 2000. After a year of courses evolving rapidly, instructors and administrators felt confident in their ability to present instruction using this medium. Could this confidence be supported by analysis of students' perceptions? Research questions included: (1) Has the change in service delivery from face-to-face classroom instruction to online instruction led to a satisfied student? (2) What student qualities are prominent in leading to a satisfied student who operates in our online environment? (3) What are students' attitudes toward online courses they are currently completing? A non-experimental descriptive study using an online survey determined student perceptions. Results were transferred to numerical measures to determine a perception score. Higher scores signified a more positive perception toward web-based learning. The conclusions drawn from data are that the overwhelming majority of respondents have strongly positive perceptions toward their online learning experience.

Background Information

Remaining current with technological innovation and meeting student needs has become crucial to the competitiveness of higher learning institutions. The pedagogy by which institutions of higher learning now offer instruction to students continues to evolve and change into some new and different models. The causative factor of this is twofold. There has been a dramatic increase in the nontraditional student population, and institutions of higher learning have responded to this changing student body, with it's attendant change in needs. Secondly, the broad availability of technological advances has provided an opportunity for more and more schools to take their courses into sophisticated online environments that previously were open to only a few elite institutions. The combined effect has been to fuel the phenomenon of changing the service delivery model of instruction at colleges and universities.

Statement of the Problem

Austin Peay State University (APSU) has seen a dramatic, rapid rise in the online course offerings and number of students enrolled in online classes. What are students' perceptions of these courses? Is the administration alone in believing the instruction and experience is positive for the students who choose this medium? The higher education community must gauge success based, in part, on the satisfaction and perception of the students they serve.

Review of Related Literature

Nearly fifty-five percent of all four-year public institutions of higher learning offer complete degree programs through online courses (Bataineh 2000). Current literature has much to offer us concerning student perceptions of online learning around the world. From longitudinal studies with over 15,000 participants (Rekkedel 1999) to small research projects involving just seven students (Sorg & McElhinney 2000), research has overwhelmingly found students with positive perceptions of learning over the Internet. An in-depth analysis of current research indicated some very prominent factors that are involved in determining whether students' perceptions are positive or negative. By far, the variable of interactivity on

three different levels defined the strength of students' perceptions. Other factors include computer knowledge base (Solloway & Harris 1999), prior experience (Ewing-Taylor 1999), community-building online (Kolloff 2000), and gender (Sanders & Morrison-Shetlar 2001). The literature also is rich in attempts to identify traits among individuals who are successful in their online experiences and how those traits can be used as indicators for predicting student success

Methodology

The research sample was derived from the total population of students enrolled in online courses at APSU in the Fall semester of 2001 (approximately 450 students). The researcher developed a 25-question survey that included demographic information, computer skills and online habits, and a Likert-type response scale about perceptions toward online instruction. Completed surveys were compiled to determine perception scores for each student and each item on the survey. The instructor of record for each of the online courses (18 individuals) was asked to give their students the opportunity to participate in the online survey. Results were emailed directly to the researcher.

Results

The decision of which courses and sections would be given the opportunity to participate was left to the instructors of those courses. While several of the eighteen faculty members asked their students to participate in the online survey, most did not. One was found to have offered an incentive to his students to participate in the study. Twelve percent ($n = 56$) of the students who were enrolled in online instruction participated by filling out the online survey. It is not known how much of the online population was given the opportunity to participate.

Nineteen of the 56 respondents rated their courses in the top ten percent of the range; there were no scores in the bottom ten percent. The median score is 58 out of a possible 68. Seventy-five percent of the respondents scored above the mean (52). In depth analysis of the data is ongoing and will be completed before definitive conclusions are drawn from the study. However, a preliminary analysis makes it clear that the results are skewed strongly to the right; this is seen as an indication of positive student perceptions toward their online experiences at APSU.

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Distance Learning Program Review

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Abstract: Recently the college of education faculty and administration at a regional state university stated that the college needed a thorough review of its policies, procedures and plans regarding distance learning. The college's technology committee collected data to establish the college's history, current status and goals. Faculty members were surveyed to learn about their individual experience and interest in distance learning, and to learn about the issues they felt were important to resolve as the college moves ahead in distance learning. The data was used to draft a 3-year plan and a 6-year plan for distance learning at the college.

A strength of distance education is its potential to focus the learning process on the student. Courses and programs that emphasize their focus on the student's strengths and needs will succeed in attracting students. In order to build their reputations and keep students, courses and programs must reach quality goals. Instructors have concerns regarding the identity and honesty of the students doing the work in distance education courses. A survey of 850 Americans by the American Council on Education found that 43 percent think distance-learning courses do not measure up to those offered in person (Evelyn, 2001).

In its December 2000 report to Congress, the Web-Based Education Commission made high quality online educational content one of its seven critical issues. In order for a student or institution to determine whether quality has been achieved, quality must be defined. A primary goal of educators is developing independent learners who can capably apply their knowledge to new situations. To ensure that distance education offerings meet this goal, providers must identify desired learning outcomes and instructional methods. Quality indicates that instruction is effective and appropriate. The definition of quality may include quantitative elements such as completion rates, student performance, and student evaluations of the learning experience. Qualitative dimensions may include ratings of teaching-learning events, materials, learning process, pace, activities, content and options offered to students (Cavanaugh, 2001).

During the 2000-2001 academic year, college of education faculty and administration at a regional state university stated their belief that the college needs a thorough review of its policies, procedures and plans regarding distance learning in order to ensure that we continue to provide quality programs and to uphold our reputation for attention to students' needs while expanding our ability to serve the community. To begin the process of managing distance learning in the college, we gathered data to establish the college's history, current status and goals. The college Dean and department chairs designated the college's Technology Committee as the group to oversee the process. The committee selected a member with distance education experience to lead the process, with a student assistant. To learn the extent of the college's past involvement in distance learning, a history was compiled. The history listed the names of courses taught via distance technologies and information about the year and term, instructors, students registering, students completing, and student performance and satisfaction information when available.

The baseline history showed that over the four academic years during which the college offered distance learning courses, 23% of the college's full-time faculty members had taught distance learning courses. In the university, fewer than 5% of faculty taught distance education courses during that time period. In fact the college of education began offering distance learning course two years before any other college in the university. Between 1998 and 2001, the college offered 30 distance learning courses, compared to 16 offered by all of the other colleges combined. The college has served 375 students via distance learning. Throughout the 4-year period, the numbers of courses and students involved in distance learning at both the college and the university levels have steadily trended upward. The historic information indicated that distance education, while new to the college and to the university, has become more important in meeting our educational missions. Clearly, there is interest in continuing to develop our distance learning program. However, during the four years that distance learning has been available, there have been no standards or quality controls applied to courses, delivery or students, at either the college or the university levels. As interest and involvement in distance learning grows, concern over maintaining quality grows.

The college distance learning review entered a stage of assessing the current status of distance learning. Full-time faculty members were surveyed to learn about their individual experience and interest in distance leaming, and to learn about the issues they felt were important to resolve as the college moves ahead in distance learning. An open-ended email survey was distributed, and follow-up interviews were conducted to ensure that each faculty member had an opportunity to participate.

Survey items pertained to past or current courses taught using distance elements, distance elements used (email, Blackboard chat or discussion, web-based projects, teaching via audio or video, other) for enhancing or replacing classroom instruction, interests in teaching a future distance learning course either fully or partly distance, college courses that would be well taught using fully or partly distance learning approaches, college courses that should not be taught using distance learning, benefits to the college and our students of expanding our distance learning offerings, concerns about the college expanding distance learning offerings, and issues that are most important to resolve as the college moves ahead in distance learning.

During the survey period, background information was collected regarding distance education policies and procedures in place or in development at the university's other colleges and at other colleges of education in the state. The colleges' Dean's office and web pages were consulted to learn how distance education was managed. Data was gathered regarding whether the college has a faculty review board, a guidebook, or policies regarding decisions about distance learning courses and instruction. Copies of any available materials were collected.

Faculty survey results and college inquiry information was compiled and summarized in a report that was submitted to the college Dean, department chairs and the technology committee. The data about past distance learning offerings and current faculty status was used by the technology committee to draft an outline for a 3-year plan and a 6-year plan for distance learning at the college. The outline is shown below. The college's comprehensive distance learning review is currently entering the action phase, in which a detailed policy and plan will be developed by a representative group of faculty members.

Plan for distance learning at the college of education

I. Policy regarding appropriate courses for distance environments, and procedures for adding distance components to courses
   Including Faculty proposals, Proposal review process, Rationale for distance component, Quality assurances, Faculty support in developing courses, Student screening

II. Infrastructure and support needs
   Including Equipment, Facilities, Faculty support, Student support

III. Plan for building student enrollment in distance learning
   Including Quality courses and instruction, Student satisfaction and success, Meeting community needs, Appropriateness of communicating distance learning opportunities to students locally, statewide, nationally and internationally

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Design of Student Model Centered Web Based Adaptive Learning System

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Abstract: Web-based education systems are becoming increasingly popular in recent years; however, most of the systems developed so far use static hypermedia as the manner of representing contents. It's a challenge to develop advanced Web-based education applications that can offer both adaptivity and intelligence. This paper will review some related works in this area and present a design of advanced Web based learning system that support adaptive presentation, adaptive navigation and adaptive help.

1 Introduction

The first comprehensive review on adaptive hypermedia system can be found in (Brusilovsky, 1996, p. 87, in 2001 the author continued tracing research progress in this area (Brusilovsky, 2001, p. 87). Since 1996, Most of adaptive hypermedia are education hypermedia which are inferred in (Brusilovsky, 1996, 2001).

As for adaptive collaboration support, an example in this area can be found in (Greer, 1998, p. 494). This paper reported an Intelligent Helpdesk system which integrated two cognitive tools: CPR (Cooperative Peer Response) and Phelps(Peer Help System).

In this paper we will present a web based learning system which integrate adaptive content with adaptive help centered by student model.

2 Designs

Our schema is a student model centered integrated learning system feature adaptive presentation, adaptive navigation support and adaptive help. The system structure can be depicted as Fig 1.

The data part of a web based learning system is made up of course fragments, instruction strategies, domain model &course structure, student models. Student Model consists of user's knowledge level, learning goals as well as their background. User's knowledge level is an overlay model. For each domain model concept, an individual overlay model stores a value which is an estimation of the user knowledge level of this concept.

An adaptive engine will be used to generate web page dynamically based on values in the User Model and other data listed above when the curriculum is delivered via web; the pages demonstrate the features of adaptive content and adaptive navigation.

Help system is a tool that resides on a page. When a student ask for help, help information is generated according to the position of current question as well as knowledge level of the User Model. The system utilizes entries in forum & FAQ which are indexed by concepts of Domain Model and course fragments to generate personalized help information.

The help system can also consult a discussion forum; each topic of the forum is indexed by concepts in Domain Model. When user wants to submit a question, the user must select one or more concepts (from the list). The system can use the user input to make sure that all FAQ and contents of discussion forum are correspond to the (user selected) concepts.

3 Progress of the work

Our work is still in the early phase; our goal is to implement a suit of tools to help instructors to produce such an on-line course easily without writing programs. These tools include:

- Tools of define domain concepts, learning goal and background knowledge
- Tools of define class structure
- Tools of define rules of page construction
- Tools of define prerequisite concepts and output concepts
- Tools of create exercises
- Adaptive engine
- Help engine
- Discussion group on indexes for domain concepts

By this system, the teacher will be easily to develop an on line course which is an adaptive education media. In addition , there is a adaptive help tool available. Other common tools can also be linked to this course. All of these tools provide a leaning environment for the students while they learn via Internet. We believe that our work will be beneficial to web based distance education.

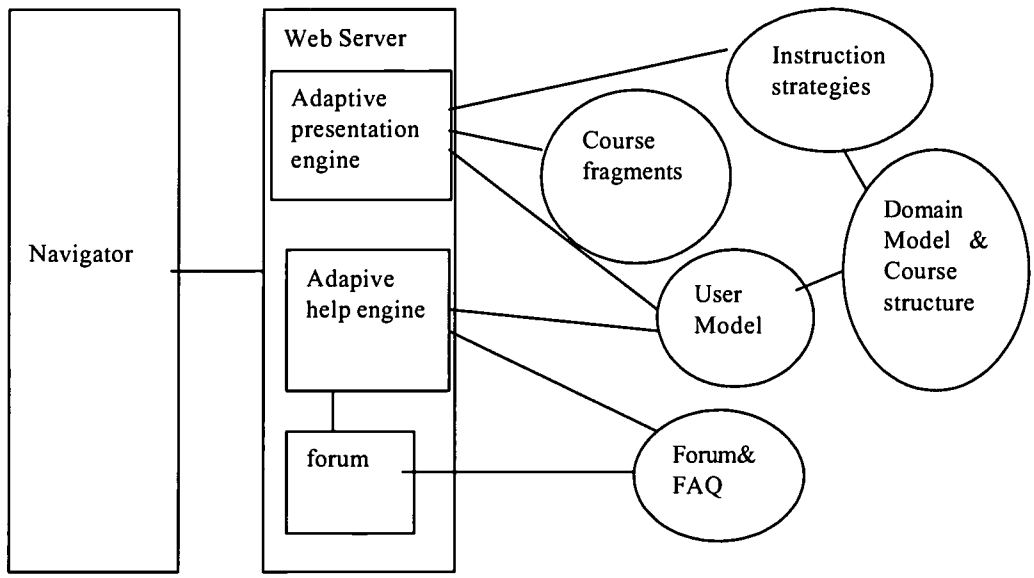

Fig 1 System Structure of Adaptive Learning System

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Teaching through tragedy: Use of dynamically created websites to maintain communities of learning.

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Abstract: During the Summer of 2001 the University of Houston, together with the rest of the Houston community, suffered through one of the most devastating storm events in memory – Tropical Storm Allison. At the time of Allison's arrival the author's summer courses were two-thirds complete and everyone was looking forward to a smooth completion of a successful term. As a result of Allison's impact the university's main campus was shut down for a one-week period, and university servers supporting instructional tools went off-line.

This paper will describe how these courses were able to successful maintain there direction via a pair of dynamically created emergency websites. These websites successfully maintained a community of discussion within the class and enabled the completion of the remaining projects. This paper will outline the background leading to the collapse of the normal instructional infrastructure, the mechanisms and logistics of creating an alternative instructional infrastructure, and a discussion of its effectiveness.

This proposal was first thought of during August of 2001. In the chilling climate following September 11th it is comforting to know that even when normal systems are not present we can still fulfill our instructional calling.

Introduction

We often take for granted that there will be a minimum of support for our instructional efforts. At a bare minimum we would expect a classroom, some type of regularly scheduled meeting time, and a supporting technology infrastructure for web-based activities. During summer of 2001 at the University of Houston we had none of these due to the impact of Tropical Storm Allison. The university itself had been closed due to massive flooding (much of the downtown Houston area was underwater click on:

http://hometown.aol.com/mkahnl/Courses/Tech_Math_II_S2001/cathys_powerpoint.htm

to see a few pictures showing the extent of the devastation), the university technology infrastructure was off-line (talk to Jerry Price, I am sure he can tell you a few stories!), and students were in survival mode and their resulting schedules were chaotic at best.

Technology to the rescue

This paper will describe how a pair of emergency websites, literally created on the fly, together with extensive phone conversations kept the courses alive. These sites were not fine tuned creations, but serviceable constructs responding to the needs of the moment. The author during this period often found himself up at 5:00 am with a cell phone in each ear and a voice transcription unit plugged into the computer. Despite these many trials feedback from students indicated that they felt they had more one on one feedback given in the class then other courses they had taken on campus.

The paper will further describe some of the logistical challenges of maintaining contact (one student threw a 200' telephone cord across an alley to a neighbor's apartment which still had phone service!) as well as describe differences in student product when compared with more traditional offerings of the courses. I will finish by including student comments on the courses. I am planning on including the url's for the emergency websites so that others can see what was done.

PIONEER STEPS FOR NEXT EDUCATION DECADE

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Abstract: At the decade of the 90's the use of the Personal Computer – PC, became common due to the fall of its price. The spread of PC's all over the world and its connection through networks, Internet and Ethernets, made this equipment a mean of communication used by people from different parts of the world. This achievement enabled a faster and even more effective communication (e.g. chat, e-mail, net-meetings, etc) (see Barradas & Guerra 2001). Many were the areas that benefited from the spread of PC's and the new Information Technologies (IT) implicated, namely the areas of education and formation courses. With Internet and due to the growing necessities of the common citizen, nowadays is possible and it is being even more stimulated the long distance learning; this has been one of the emergent concerns of the latest scientific meetings as (Technical meeting, 2001).

Introduction

It is common to hear about long distance learning using IT (as it is the case of some virtual Universities) [1]. In the following sections of this paper we will present some projects developed in Escola Superior de Tecnologia de Castelo Branco (EST). The aim of these projects is to improve the teaching of engineering subjects. This improvement isn't only related with contents but also with the logistic support needed by students with less availability to be in campus, such as worker-students. In this paper we refer to some important items needed to approach both teachers and students from distant places.

Interface through www pages

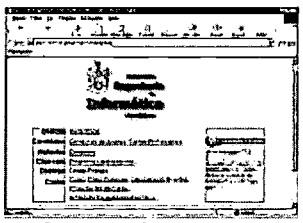
The School has actualized online information of all subjects that integrate the curricular plan of the Computer and Computer Science Engineering courses as we can see in (Fig. 1a) [2]. For each subject the students have access to the teacher's contact (email, etc), to the subject's program, evaluation regulations, technical and didactic information, bibliography, etc. It is without doubt an extremely positive mean of communication between teachers and students; it allows the direct contact between them once the student has finished his graduation. Therefore the page allows former students to get knowledge actualization; it's also useful for those trying to get a higher education, as they know previously the contents of the subjects they will study.

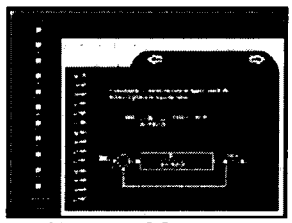
Supporting teaching tools

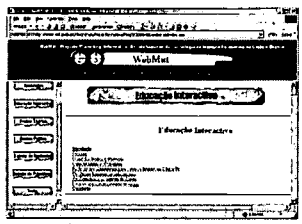
A didactic Compact Disc (CD) is being developed whose contents are related to the control area subjects (Digital Control, Dynamic Control and Computer Control), as showed in (Fig. 1b). The CD will serve as a teaching support in EST and in other Engineering Schools where these subjects are part of the curricular contents.
There is also a logistic component, www page, whose gold is to improve the CD ROM's effectiveness. Through this page the support is guaranteed to the components in need of actualization; it also allows taking doubts

[1] http://www.accrediting.com/vuaa.htm
[2] http://www.est.ipcb.pt

related with the referred subject. Users' suggestions are collected to improve both CD and www page. Control Teaching Multimedia Tools – FEMECO (Marques et al. 2001) is the name given to these tools.
The referred page serves as a student support; it has additional information, which allows communication with the teachers of the subjects, whom can also elucidate doubts. Therefore it contributes to a better learning and enables communication amongst instructor and student. The page is frequently actualized in order to enable effective support.


a) Course web interface


b) FEMECO CD



c) WebMat

Figure 1: Supporting teaching tools

Other www sites are being developed to improve teaching of different subjects such as the case of Mathematics (Fig. 1c). Other software is being developed to allow remote control of practical experiments and used in long distance laboratory experiments, this is particularly important for engineering courses (Chasqueira et al. 2001).

Special teaching

Information Technologies are a paradigm of society. However, there are some neglected groups as it is the case of handicapped people with greater access problems. In order to offer knowledge to a group of those ill-favoured people, it was developed in EST a support teaching integrated system for people with hearing deficiencies (Valente & Guerra 2001). The greater advantage of this application is the integration of both spoken and written languages with sign language. Although it was developed for students it also enables parents and teachers to use it to transmit knowledge. This is another of the new information technologies applications developed in EST.

Conclusion

In this paper we present a summary of the new information technologies techniques, used in long distance learning, developed in EST. We also include tested strategies to motivate students to the technological courses, Computer Science and Computer Engineering, lectured in Castelo Branco-Portugal.

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Teaching Research Methods Online: Course Development and Comparison to Traditional Delivery

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Abstract: The development and evaluation of an online Educational Research and Evaluation course for Master's level students in a College of Education is described. Rationale for the course's highly structured design and the inclusion of a synchronous group discussion component in an otherwise asynchronous course is discussed. Students' performance in the 2 sections of the online course is compared to a traditional section of the same course. Results indicate that students performed equally well when applying their knowledge in written papers, but that the traditional testing situation put those students at a disadvantage compared to their online counterparts.

I have three goals in mind as I write this paper. The first is to describe the development of an online version of an Educational Research and Evaluation course for Master's level students in a College of Education. Both the number of courses offered and the number of entire degree programs offered online doubled between 1995 and 1998 (Phillips, 1999). Research methods courses are required in most Master's of Education degree programs across the country. As many universities strive to offer online degrees, research methods courses will increasingly be nominated for conversion to online delivery formats. A description of the process of designing and implementing such a course will provide insights for those who are or will be involved with online delivery of similar courses. My second goal for this paper is to go beyond a description of the course development process to provide insight into how online delivery compares to traditional formats for research methods courses in education. I will describe data from three groups of students: those enrolled during the first semester online delivery was offered, students enrolled during the second semester online delivery was offered, and those enrolled in a traditional section during the second semester online delivery was offered. The third goal for this paper is to describe how teaching the course online one semester informed how I taught it during the second semester. While many forces push for increased online delivery of courses, it is important to ask how these courses compare to traditional methods of instruction. I believe there is a trade-off between online and traditional delivery formats so that the benefits and drawbacks of each must be weighed.

Online Course Development

Consistent with the first of my goals for this paper, I will describe my particular experiences in the process of online course development. Let me first relate my reasons for moving into online delivery for Educational Research Methods. This is a course that all students who receive a Master's degree in education from Northwestern State University, and many other universities, must complete. It is traditionally a very demanding course for students and one that most students leave for the end of their program. It is also one of my passions and along with statistics is a course that I think students can really learn to love if it is delivered properly. Finally, at Northwestern State University, Educational Research Methods was a course that had not been taught online before. I knew that several complete degree programs would become available for distance education students if this course was offered. I realized that under these circumstances someone would be developing this course for online delivery and I decided that my background and love for the course made me the ideal candidate. I started my journey through the online adventure by signing up for 33 hours of training funded by the Learning Without Travel initiative on distance delivery methods available at Northwestern State University.

These methods included using compressed video to present instruction where students could see and hear their instructor and receive feedback in real time. This system has some definite advantages, but also has the drawback of forcing students into a particular timeslot and physical location for instruction. Frankly, I was not convinced that dialog with a 1-2 second delay was really enough of an advantage over asynchronous delivery methods to warrant restricting students to a particular time and physical location for instruction. In my mind, they might as well make the trip to a university for a traditional course if that was the best we could do.

I decided that truly asynchronous Internet delivery was my delivery method of choice. This meant using the Blackboard delivery system. I received training on how to develop, design, and manage a course using the Blackboard delivery system. The training went a long way to preparing me for the course, but there was much more that could only be learned by doing. One of the many truths I learned in those training session was that preparation is everything. In traditional delivery formats, the professor has much more room for on-the-fly adaptation as they assess their students' progress. That type of assessment and adaptation is not possible without face-to-face interaction. Preparation becomes your only substitute. Preparation in the structure of the course; preparation for every contingency you can conceive of because others you haven't thought of will arise.

I spent several months preparing and designing my course before it opened for student enrollment. As I began, there were several ideas I knew I wanted to incorporate into this course. Those ideas had origins in my graduate training in educational psychology and found substance through the training sessions I was able to attend. I am greatly indebted to Darlene Williams for her expert training and willingness to help me in bringing these ideas and goals into reality through the Blackboard delivery system.

First, I knew that I wanted the course to have a clear structure that led students through the material. I knew that other instructors in other courses preferred to post most of the assignments at the beginning of the semester and allow students to work at their own pace. I don't think Educational Research Methods is the kind of course that this is appropriate for. The material is difficult and complex for students. I think that a guided tour with a more analytical or piecemeal approach is warranted. Of course, students have to be able to bring it all together in the end, but I think they need to perfect the components first. I had in mind the cognitive apprenticeship kind of model discussed by Barbara Rogoff and Jean Lave (Rogoff, 1990) and the idea of a more knowledgeable guide through the Zone of Proximal Development that Lev Vygotsky (1978) described. This model is sometimes described using the metaphor of an apprentice tailor learning to complete a garment. I would allow students to work on small pieces of the garment and guide them as they perfected each piece before they would tackle a complete garment on their own. For Educational Research Methods, that complete garment was an empirical research proposal complete with an in-depth literature review, specific methods, and detailed measures. A research proposal that would allow students to go out and collect data for a thesis the very next day if need be.

A second idea that I knew I wanted to incorporate into this course was the use of small group discussion. This was at first nothing more than a vague goal. I thought that group discussion among peers in an asynchronous course had the potential to replace much of what was lost by not having face-to-face class meetings. Threaded discussions are a common way of trying to facilitate group discussion in asynchronous courses, but I didn't think they would be enough. For one thing, threaded discussion lists have a reputation for being difficult to sustain. I knew that I would be using threaded discussions, but wanted to supplement them with more real time types of interactions. With this goal in mind, and Darlene's expertise reassuring me that it was possible, I decided to require students to form into small groups with designated times to meet in the Virtual Classroom section of Blackboard. This introduced a synchronous component to the course and I was unsure how students would react to the requirement.

With these ideas in mind, I put together a course where just about every week involved reading a chapter from the textbook, reading my lecture notes on that chapter, meeting in the Virtual Classroom to discuss issues with classmates, and posting questions or comments on a threaded discussion board. The final research proposal was broken down into 5 sections and a draft of each section was due about every other week. I then read these drafts and provided detailed feedback on how to improve them for the final version due at the end of the course. Weeks that did not have drafts due usually involved taking a quiz on the reading assignment for that week. These were open-book, open-note quizzes, but were also timed so students had to be well organized. Finally, I included a midterm and final exam that students downloaded and had 3-4 days to complete before emailing me their responses.

Online Course Delivery

Delivering this course turned out to be quite labor-intensive. I thought that the amount of up-front work that went into designing the course would make the actual delivery less intensive compared to a traditional delivery format. This did not turn out to be the case, but if I had not put that effort in at the beginning, then delivering the course would have been completely overwhelming. As it was, I averaged at least an hour every day just answering emails and questions from the threaded discussions. Each week, I also graded quizzes and sent feedback on the correct answers or reviewed proposal drafts and sent detailed feedback on how to improve the final version. The amount of work that I put into delivering this course was about the same as that I put into delivering traditional sections. The difference was that much more planning had gone into it before instruction ever began.

You may be wondering what could take up an hour a day answering emails and discussion lists. For the first few weeks of the course, students had three overriding concerns. Firstly, some had difficulties with email and Internet technology. I learned quickly that some students were well suited to taking a course online, while others needed a great deal of "basic training" in skills such as sending emails with attachments, saving word processor files in different formats, and navigating a web site. I believe strongly that there are some students who belong in online courses, while others simply do not have the prerequisite skills. I don't mean that this latter group cannot perform in an online course, but simply that they would be better served in the traditional classroom. Even for those with a strong technology background, online courses can be challenging as evidenced by this email excerpt:

> I have been unable to email you all day. I faxed my final exam, since our server at school has been non-functioning, and when I got home and tried to email from my regular browser, that also had problems. I am trying this route. I hope this is acceptable (anonymous student).

Both the professor and the students must be flexible and able to problem solve with technology in order to make an online course work. For me, this flexibility included accepting assignments by several routes, being able to read files in several different formats, and being able to respond to emails and phone calls promptly.

A second early concern involved questions about how to navigate the course site. Navigation difficulties were generally fairly easy to resolve. It was just a matter of clearly explaining how I had organized the course site. Students entered the site on an Announcements page. All assignments were on a separate page and listed according to their due date. The assignments for each week were posted at the end of the previous week. This page explained where they needed to go to find links to lecture notes, threaded discussion boards, the virtual classroom quizzes, explanations of proposal drafts, or whatever was needed to complete that weeks assignments. The course syllabus and other general course documents were posted on a course content page.

Students third concern in the first few weeks involved the Virtual Classroom discussion group assignments. Many emails and threaded discussion postings from students indicated that they had signed up for an Internet course precisely to avoid that sort of time constraint. Still, I maintained that they could find 2-5 other students and meet at anytime during the day or night. The groups were finally formed, albeit with a good deal of grumbling. I asked students to send me transcripts of their synchronous discussion sessions in the Virtual Classroom and responded to any unresolved questions from those. It turned out that, by the end of the course, most students indicated that the discussion groups were their favorite part of the course. It allowed them to get to know their peers, to discuss the content in a way that they had not done in any other online courses, and to get feedback from me for anything that their peers couldn't help them figure out.

Once these concerns were resolved, the course delivery ran fairly smoothly. I still had emails to answer, threaded discussions to respond to, and Virtual Classroom transcripts to read, but student questions became mostly content oriented as they became familiar with the technology and structure of the course.

Comparison to Traditional Course

The third goal for this paper is addressed by focusing on students' work and feedback relative to the Educational Research and Evaluation course as presented in each delivery format and across two semesters. The data include all and only regular course assignments: quizzes, tests, journal article critiques, drafts of a research proposal, e-mails, group discussion logs, etc. Students were asked to provide consent for their course performance to be used in this comparison. The online course was first delivered in Spring 2000, which is a 16 week semester. Forty-nine originally enrolled. Of those, 12 withdrew and 14 of those

that completed the course agreed to participate in this study. The online course was modified and delivered again during a 9 week session in Summer 2001. Thirty-six students enrolled, of which 3 later withdrew. Of those that completed the summer course, 16 agreed to participate in this study. I also taught the course in the traditional classroom format during the summer. Twenty-three students enrolled for this section and 1 later withdrew. Nineteen of the 22 that completed the course agreed that their performance could be reported in this paper.

A comparison was done of the proportion of total points earned in the course across the three sections. Students in the first semester online course averaged .93 (SD=.03) of the total points available. During the summer session, students in the online section averaged .91 (SD=.05), while students in the traditional section averaged .88 (SD=.07).An ANOVA showed a significant effect of section [F(2, 46)=3.74, p=.03]. Scheffé post hoc analyses (p<.05) revealed that this significance was driven by the difference between the first semester online course and the traditional summer section while other comparisons were insignificant (See Table 1). This difference between the summer traditional section and the spring online section may be due either to the online versus traditional delivery format or to the 9 week versus 16 week session. In trying to better understand this difference, students' performance on their major assignments was examined.

Table 1: Total proportion of points, proportion on critique and proposal writing assignments, and proportion on midterm and final exams for each section.

Section	Critique	Proposal	Midterm*	Final*	Total Points*
9 Week Online	.90(.11)	.89(.05)	.89 (.05)	.90(.06)	.93 (.03)
15 Week Online	.91(.12)	.87(.12)	.90(.05)	.86(.06)	.91 (.05)
15 Week Traditional	.94(.04)	.86(.13)	.71 (.15)	.63(.15)	.88 (.07)

* Significant (p<.05) difference across course sections.

The proportion of points earned on a critique of an empirical research paper ranged from .90 (SD=.11) for the first semester online to .94 (SD=.04) for the traditional section in the summer session. For the final research proposal assignment, this range ran from .86 (SD=.13) for the traditional section to .89 (SD=.05) for the first semester online. ANOVA's examining the effect of section on the proportion of points earned for these writing assignments showed no significant differences between sections (See Table 1). This is very interesting. Students in both sections were able to write equally solid journal article critiques and research proposals. The ability to critique published research and to write a research proposal were primary goals for this course. They involve students applying their content knowledge of research methods to the real world contexts of both evaluating existing research and designing new research studies. The online course appeared equally facile at allowing students to attain these goals.

The case was different for the exam scores. The first and second online sections earned .89 (SD=.05) and .90 (SD=.05), respectively, on the midterm and .90 (SD=.06) and .86 (SD=.06) on the final exam. The traditional section earned .71 (SD=.15) and .63 (SD=.15) on the midterm and final exam, respectively. ANOVA's examining the effect of section on students' midterm [F(2, 46)=20.24, p<.000] and final exam [F(2, 46)=34.08, p<.000] scores revealed significant differences. Scheffé post hoc analyses (p<.05) showed an advantage favoring both online sections when compared to the traditional section.

There is an obvious reason for this difference. Students in the online sections had several days to complete the exam in which their textbooks and notes were ready at hand. Students in the traditional section had to take the exam in class without using their text or any notes. While this clearly explains why the traditional students did not score as well, it also raises an important question. If both online and traditional students critiqued journal articles and designed empirical research studies with equal facility, then how do we interpret the difference in their exam scores? It seems from their papers that both groups had equal mastery of the material, but the testing situation precluded traditional students from displaying their knowledge. This may be seen as an argument for open book/note testing or as an inherent advantage for online instruction where instructors are all but forced to create open book/note exams. Even though the traditional students were at some disadvantage regarding their tests, the differences in overall course grades were slight. This difference was only significant when compared to the first online section and not to the second. This seems to argue against it being driven by test scores, because both online sections had the advantage there, and for it being driven more by the length of the session, 9 versus 16 weeks.

Insights

Besides the argument for open book/note testing and the conclusion that the online course seemed to allow students to apply research knowledge just as well as the traditional course, there are other insights to be gleaned from the development and delivery of this online course. First, and perhaps foremost, is that online courses are wonderful for some students, but inappropriate for others. Along with this I believe that students (and perhaps instructors) do not always realize what qualities make someone suitable for online courses. These qualities include an ability to work independently and to motivate themselves; an ability to learn complex material from text, written explanations, and graphic representations; and a certain baseline technological savvy. Those who need external motivators, learn better through face-to-face interaction, and/or are frustrated using computer, email, and Internet technologies would be better served in a traditional classroom. They will find that the online course is simply more challenging than its flexible time schedule is worth.

These considerations should also be turned to evaluating courses as to whether they are appropriate for online delivery. I believe that at least three questions should be asked before an online course is developed:

1) Are the goals or content of the course such that student motivation is likely to be low?
2) Is face-to-face interaction crucial to meeting the goals of this course?
3) Is the student population for the course likely to be technologically unprepared?

If the answer is yes to any of these, then the course should not be developed for online delivery.

A second insight is related to the workload involved in teaching online. As I talked with colleagues who don't teach online, I sometimes got the impression that they thought it was easier than traditional sections. That not having to show up to lecture each week meant that there was less work and less preparation time. What I found instead was that the lecture time was more than replaced with answering emails, responding to discussion threads, and reading Virtual Classroom chat logs; and that the preparation time was moved back so that it primarily occurred before the semester ever began. I found that teaching online required me to do much more technological problem solving, to be more flexible in responding, and more available to my students than when I taught a traditional section. That said, I found that teaching online was an extremely stimulating experience that made the extra, or at least different, workload well worth it. At the end of it all, this comment from one of my students sums up both my experience and what I hoped to impart to those in my courses:

> This semester has been a true learning experience for me. I have learned much both about research practices and about myself as a result of participating in this course. I have a better grasp of the components of an effective research study, the process involved, and the time required (anonymous student).

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Virtual Learning? Enhancing teaching and learning through ICT

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Information and Communication Technologies present students with a constantly developing toolbox. Students use the tools to construct artefacts from a range of sources and inputs. The end product - a frozen point in a shifting panorama of possibilities - asserts their identity. These post-modern magpies use skills and concepts to combine source materials that meet the needs imposed by their teachers and tutors. The surface gloss confuses and dazzles: what is original? Where are the sources? Which (if any) is attributed? The question of whether the learning and skills embodied in the artifacts are transferred to conventional learning raises other questions.

The conventions and assumptions of institutional learning have become increasingly at variance with the praxis of the learners, whose style is that of bricolage, based on the hardware and the software to which they have access. The content and form of students' learning is inscribed within the artefacts which they produce. Knowledge and outcome are synonymous for them: they have become cyber bricoleurs.

Students with computers have become owners of the means of their knowledge production, and hence of their cultural capital. The symbolic capital which issues from this is virtual: the simulations transient: constantly updated. The standards and expectations of the education system sit uneasily with the values of the digital auteurs who form the vanguard of the postmodern economy.

At a time when e-learning is seen as a solution to the needs of both industry and the education system, the work and words of these students may shed some light on the ways in which it takes place.

The work of these autonomous learners in the classroom and at home is examined and related to the curricular framework in which it takes place. Can their teachers assess the originality of the work, or are they dazzled by a surface gloss which they can never achieve. Do the ways in which these students learn complement or clash with the assumptions of their teachers?

The use of a number of online services to support teachers is examined. These range from services which simply provide the equivalent of online worksheets, through those that support the teacher in the delivery of the curriculum by offering a highly diverse set of resources and student activities, to those that provide 'one-off' curriculum enrichment activities.

The research basis of this paper is a six-year longitudinal study at an 11-18 school of one thousand eight hundred students. The research investigated the impact of ownership of computers on work, learning styles and concepts of Mind on students and teachers.

Facilitating On-line Professional Development

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In today's "knowledge economy," institutions of higher education struggle to keep up with the demands of lifelong learners, driven as these are by shifting economic and political conditions both nationally and globally. Significant among these new demands is the insistence that practicing teachers upgrade their technology skills in order better to implement and integrate computers in the classroom. This project seeks to articulate in greater depth and detail than any list of "best practices" can provide, a well-established professional development program for practicing teachers which makes use of both traditional and on-line delivery methods. Through a rich, fully elaborated study of a range of instructional forms (including on-line, classroom-based, workplace-based and peer mentorship methods) we seek to understand and specify what hinders and, most importantly, what enables learning and instruction in web-based environments.

In all the ways we have, in the past, understood alphabetic literacy as the keystone for affording in practice the rights affirmed in principle to education for all, it is necessary now to understand contemporary technological changes as these continue significantly to alter the terms and conditions of access to public educational goods. Although we know a good deal about the role, functions and uses, and forms of pedagogical support for traditional text-based literacy in the provision of educationally valued knowledge, we urgently require an up-dated conceptualization of functional literacies and their optimal development – one which is capable of taking seriously into account the impacts and implications of new learning technologies for information, communication and expression.

Despite the eagerness with which new media, computer technology and on-line delivery systems have been widely embraced across Canada, educational institutions have failed adequately to study the pedagogical conditions for attaining in practice what are too often merely presumed in principle to be actual educational efficacies and outcomes of e-learning technologies and resources. In the rush by postsecondary institutions to put courses on-line, we are only just now, post hoc, beginning to be critically attentive to research which examines educational outcomes of online learning and teaching (see, for example, Bonk, 1998; Bonk, Kirkley, Hara & Dennen, 2000; Owsten, 1997). Moreover, in light of increasing recognition of the actual inaccessibility of on-line instructional content to a range of "targeted" users (in this case, in service public-school teachers in university-based courses), forgotten have been familiar – and essential – educational questions. Primary among these is the question central to our own research: when it comes to on-line learning, what *kind* of help helps?

As a result of the omission of critical questions about curriculum and instruction in online learning research, what works to facilitate learning with web-based tools and resources is largely not known or when it is purportedly known, "best practices" (Jenson & Lewis, 2001) are unproblematically generalized from case studies which are in fact small-scale, subject/context specific, and of short duration. This means that much of the research

currently available on web-based learning is little more than a "snap shot" of a single course which has been placed on-line.

The purpose of the research described in this paper is to improve the teaching of fundamental technology skills and knowledge by advancing our understanding of optimal uses of technology in education, in both curricular and pedagogical terms, in online, face-to-face, and mixed mode environments. The issues which drive this work, accordingly, are those which have largely been ignored in the competitive rush by universities to offer courses online: (1) the design of research-based, custom-built yet scalable, user/community-specific and context-specific curriculum (and not merely the "adaptation" of existing generic course content to web-based, most typically template-driven forms) (2) identification and evaluation of the full range of potential pedagogical supports for in-line learners, especially users new to learning in this medium, and (3) a persisting obstacle to sustainability of technology implementation in education: identifying conditions which facilitate the effective practical application and transfer of knowledge by and among teachers, both within and across the school as a workplace.

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A Review of Impediments to Distance Education on the Learner Part

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Abstract: This paper is a review of literature on the impediments to distance education on the learners' part. The authors believe that an understanding of the impediments to distance education on the learners' part will help teachers from at all levels (preservice, inservice, higher education) not only to set more realistic expectations from students but also to design their distance courses in a way that meets the learners' needs. Distance education is identified as "student centered" by many researchers and thus much of the research in distance education is from students' perspective. The distance education literature presents various barriers to distance learning from the students' perspective. The authors review these barriers and present them under six categories: the learner's comfort level with technology, technical shortage, level of interaction, the level of learner's psychological readiness, cultural/individual characteristics, and environmental factors.

Introduction

This paper is a review of literature on the impediments to distance education on the learners' part. The primitive form of distance education was correspondence. Since then, the form of distance learning has become more sophisticated with the use of communication technologies, including satellites, telephones, cable-television systems, computers and the Internet. The definition of distance learning in the US Department of Education glossary is " the use of telecommunications technologies, including satellites, telephones, The Internet and cable-television systems, to broadcast instruction from one central site to one or more remote locations."[1]

Although learning at a distance has existed for several decades, both the characteristics and the medium of distance education have dramatically changed due to technological advances. Educators encounter new teaching methods and forms to serve a diverse student population. In distance education teachers have different roles than they do in traditional education. In addition, there are numerous obstacles to successful distance education. Some of them are new, but many of them have existed since distance education was born (Berge, Muilenburg, 2000).

We believe that an understanding of the impediments to distance education on the learners' part will help teachers at all levels (preservice, inservice, higher education) not only to set more realistic expectations for students but also to design their distance courses in a way that meets the learners' needs. Wood (1996) and Galusha (1997) imply that knowing student characteristics and demographics helps distance teachers understand potential barriers to success and allow them to plan distance education in order to optimize student performance, retention, success, and potential barriers to learning.

Distance education is identified as "student centered" by many researchers. Therefore, much of the research in distance education is from students' perspective. Many researchers present various barriers to distance learning from the students' perspective. The author of this paper reviews these barriers and presents them under six categories: the learner's comfort level with technology, technical shortage, level of interaction, the level of learner's psychological readiness, cultural/individual characteristics, and environmental factors.

The first category, comfort level, refers to the learner's lack of technical literacy to be able to use the course media, negative attitudes toward technology, and lack of training or support from the educators.

The second category, technical shortage, includes the requirement of course materials that are cost-prohibitive for the learner, poor online connections, shortage of software, platform dependent media, and inaccessibility of materials such as extensive graphics.

The level of interaction refers to the learner-teacher and learner-learner interactions. Feeling isolated and "faceless teaching" (minimal feedback from the teacher) are the barriers in this category.

The level of the learner's psychological readiness includes barriers such as lack of motivation, resistance to change, lack of time management skills and discipline, weak goal commitment, lack of orientation, and fear of failure.

Cultural/individual characteristics refer to cultural differences, e.g. the learner's awareness of teacher expectations, the learner's disabilities that keep him/her from meeting the course requirements, language barriers across cultures, time zone differences, and learner's lack of prerequisite knowledge on course content.

Environmental factors include lack of family support, lack of peer support, lack of time, noisy study environment, changes at work, unexpected responsibilities at work, and family problems.

Literature Review

Removing the barriers created by institutions is crucial especially in reaching adult learners, learners in rural areas, and learners with employment restrictions or physical limitations (Machtmes, Asher, 2000).

Galusha (1997) classifies barriers as student, faculty, and organizational barriers in distance learning. Garland (1993) classifies obstacles to distance learning as situational, institutional, epistemological dispositional obstacles to distance learning. Garland (1993) suggests that situational and dispositional barriers are related to learners' life situation, psychological and sociological personality such as attitudes, confidence, learning style, and motivation.

In the reviewed literature barriers to distance learning on the learner's part were identified as follows: Lack of learner training, "faceless" teaching, lack of learner motivation, poor online connection, extensive graphics, cultural differences, lack of interaction, feeling isolation, lack of technical literacy, resistance to change, lack of time management skills and discipline, lack of family support, lack of peer support, lack of time, stress, poor grades, weak goal commitment, fear of failure, lack of prerequisite knowledge about course content, noisy study environment, lack of orientation, environmental conditions, illness, family problems, changes at work, unexpected responsibilities at work, information overload, language barriers across cultures, fear of technology, fear of foreseeable replacement of faculty, high cost materials, lack of support service, and resistance to change (Brown, 1996; Wood, 1996; Galusha,1997; Truman, 1995; Berge, 1998; Lehman, 1998; O'Toole, 1999; Whitworth, 1999; Berge, Muilenburg, 2000; Palloff, Pratt 2001; Muilenburg, Berge, 2001).

Learners' Comfort Level

"A feeling of alienation and isolation" was an obstacle reported by distance learners (Galusha, 1997). Whitworth (1999) states that in a learning situation in which the instructor is not physically present, both the students and instructors feel isolated from each other. Lack of motivation is one of the obstacles for distance learner. Obsborn's (2001) and Garland's (1993) studies show that learners who have lower motivation are at risk students in distance education. Truman (1995) states that lack of time management skills and discipline are obvious barriers for distance learners. The learner's "resistance to innovation" is also an obstacle in distance education (Berge, 1998).

Technical and Support Service Shortage

Inappropriate tutorial assistance and having difficulty in reaching tutors are obstacles for a distance learner (Garland, 1993). These barriers can be a psychological problem for some students who are hesitant to initiate contact with others. Galusha (1997), Berge&Muilenburg (2000) state that the lack of support, services such as providing tutors, academic planners and schedulers, and lack of technical assistance are obstacles for distance learner.

Another obstacle observed often with distance learners is a lack of suitable study materials for distance students. Wood (1996) notes that study materials must take into account the significant portion of students who enroll with little or no experience of in distance learning. These students are at risk of dropping out unless they

develop study survival skills as rapidly as possible (Wood, 1996). Lack of training is another obstacle for the distance learner. Galusha (1997) and Palloff&Pratt (2001) note that if clear guidelines are not presented, the distance learner can be confused and disorganized and the learning process will suffer. Berge (1998) concludes that the most critical obstacles reported in the survey that he conducted were resistance to and fear of changes, and lack of access to resources and people.

Level of Interaction

O'Toole (1999) explains that studies emphasize that student-teacher contact is critical to the success of the distance learning process. Galusha (1997) and Garland (1993) state that perception of poor or timeless feedback and lack of communication with the teacher are main obstacles for the distance learner. Rumbe (2000) summarizes that learners without support are likely to delay completion of a program or dropout. A lack of frequent feedback was defined an often encountered obstacle by O'Toole (1999).

Level of Learner's Psychological Readiness

Distance learners often feel lack of confidence in terms of learning. Galusha (1997) defines that lack of confidence is founded in individual and institution-related issues such as financial cost of study, disruption of family life, perceived irrelevance of their studies, lack of support from employers, insufficient support from tutors, course too time consuming, difficult in contacting tutors, change of employment, fees being too high, and feeling isolated. Insecurities often result in higher discontinuation rates among distance learners (Brown, 1996). In addition, lack of clear goals, the stress of multiple roles, learning style problems, adult pride, lack of prerequisite knowledge, lack of content knowledge are shown as barriers for distance learner in Garland's (1993) study.

Cultural, Geographical and Individual Characteristics

Geographical isolation has been identified as one of the major barriers for the distance learner. Galusha (1997) notes that contacting academic and administrative staff, obtaining study materials, and borrowing library books are major geographical problems for distance learner). A study from Wood (1996) shows that this may lead to feelings of inadequacy and insecurity, and a lack of confidence in distance learners' own abilities. O'Toole states that the learner's cultural background is an obstacle often encountered.

Environmental Factors

A poor learning environment, such as lack of family and peer support, is one of the obstacles for the distance learner as well as the traditional learner (Garland, 1993). The learning environment is critical for adults who have a lack of self-confidence. Garland (1993) classifies situational barriers as poor learning environment, lack of support from family or peers, and uncomfortable study environment.

Discussion

The dramatic growth of distance education courses and the size of the adult learner population bring problems that require great attention by both distance educators and administrators.

We believe that the discussed barriers have various sources, yet some of them interact with each other. Some barriers create others, or some barriers strengthen each others' effects. Thus, a distance teacher should be aware of all existent and potential barriers a student may have in order to design the course accordingly. We suggest that each distance course should begin with barrier inventories. Understanding real and perceived barriers on the learner's part to effective distance learning and teaching may help to find the best ways to overcome obstacles. Without knowing the barriers, it is not possible for distance learners to effectively learn. There is no doubt that the fewer barriers there are to distance learning, the more learning and learner satisfaction there will be.

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Reaching Teachers through Distance Education

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Abstract: This paper addresses how one institution makes use of distance education to offer mathematics and mathematics education courses in its Master of Science in Teaching Program. The courses are offered through a compressed video format where there is two-way communication and interaction with students and faculty. Providing courses in this manner has proven to be quite successful for students on campus as well as those off campus (at the remote sites). It has also been found that students who are at the remote sites perform just as well, if not better, than those on site.

Brief overview of Distance Education

Distance education, a term that may be interpreted in a number of ways, basically means offering courses/classes via an electronic medium. The method of delivery – audio, video, email, tele-conferencing, video conferencing, web-based – is often what varies from one situation to the next. While such learning environments may appear different than the traditional classroom, the interactions and learning that occur are just as powerful.

The United States Distance Learning Association (USDLA) has reported on studies that have been quite consistent in finding that distance learning classrooms show similar effectiveness results as those reported under traditional instruction methods. Additionally, studies often point out that student attitudes about distance learning are generally positive (USDLA, 2001). With such factors at the forefront, one program, the Master of Science in Teaching (MST) Mathematics, has been quite successful in offering courses through a compressed video (video conferencing) format for mathematics teachers or teachers who have an interest in mathematics. In what follows, I present some of the factors that influence how courses are offered in this program, how faculty support has provided such courses for students, and how students have operated successfully in such learning environments.

A Master's Program in Mathematics Education by Way of Distance Education

The USDLA has reported that distance learning must be an important aspect of higher education due to its timely and cost-effective means of continuing education and lifelong learning. It also elucidates that it is imperative in today's society to bring together learners from widespread locations for live interactions and relationships. With the aid of a video classroom designed with two-way communication, the MST mathematics program at Middle Tennessee State University (MTSU) has been able to accomplish this. The program has allowed a number of teachers in the rural middle Tennessee area to complete graduate studies in the area of mathematics by providing courses through a video conferencing format. The "on-sight" classroom is the central location for courses where the instructor delivers the course. There may be students on sight who are able to come to the campus to take courses, where other students are off campus. There may be anywhere from one to five remote broadcast sites that have off campus classrooms for students to meet at for specific course times throughout the semester.

Preparing courses offered by distance education is a major undertaking that many faculty or instructors are not well aware of until the process begins. One study, conducted by the NEA (2000), found the following:

- Over half (53%) of distance learning faculty spend more hours per week preparing and delivering their distance education course than they do for a comparable traditional course.
- Those faculty who have taught the distance education course eight or more times, spend more hours (48%) rather than fewer hours (21%) on their course.
- Most faculty (84%) do not receive course reduction or compensation for teaching a distance education course.

These points bring out that fact that while offering courses through this manner are important in reaching a greater number of students, faculty who prepare such courses are often having to commit a great deal more of their time to present such courses. The Higher Education Program and Policy Council of AFT (2001) found that some faculty

spend anywhere from 66% to 500% more time in their course preparation. This often is a major point for "newcomers" not joining the ranks that teach via distance education.

An important part of preparing a course is making decisions on how to involve students in the course – particularly those at the remote or off campus sites. *Best Practices for Electronically Offered Degree and Certificate Programs* (2001) addresses the importance of developing a rich interaction between instructor and students and among students in the design of a program and its courses. Several points mentioned in this document have been confronted by instructors and individuals involved in the MST program at MTSU. Such issues include: (1) assurance of appropriate interaction, (2) instructor response to assignments and other coursework, (3) technologies used for interactions (e.g.: email, telephone office hours, voicemail, fax, classroom discussions by video), and (4) measurement of the success of course interactions. MST mathematics faculty have been able to meet such demands due to the method of delivery adopted for the courses. The video conferencing method allows two-way communication with visual images of individuals who have spoken. Thus, all classrooms are equipped with television monitors and microphones for this to occur. Prior to class meeting times, faculty have materials (in-class assignments, returned homework or graded assignments) delivered to the respective sites for students as well as setting up other means for them to receive needed materials (e.g., email, readings/documents obtained from the web). Once a course begins, students are prepared to be involved in the course in much the same way they would a traditional course. Each site is equipped with an overhead projection device for sharing or presenting materials as well as select sites having a computer station for using software such as PowerPoint and a connection to the Internet. Students are to ask questions or to share points of discussion – both of which are vital to the success of the remote sites. Even though all students are not physically in the same classroom, they can operate like they are in the same place with the video and audio features. While most courses meet regularly throughout the semester at the various sites, mathematics faculty teaching the courses often make a point of scheduling one to two Saturday class sessions where all students come on campus for class.

One might think that students "learning" how to exist in a distance education situation would be difficult. Instead, we have found the transition for students to be rather easy. Once students get over the "shyness" of talking by use of a microphone and seeing themselves on the television monitors, the rest almost falls into place. The learning environment becomes one rather than many. This is crucial to students feeling like they are a part of a class as well as vital to the success of our courses in the master's program.

Hand-in-hand with student learning is student assessment. Since the student population described here is at the graduate level, they are expected to prepare and present work for the class – regardless of their location. All students are evaluated in the same manner and measure of course success is as challenging as that in a traditional classroom setting. Faculty involved in the distance education course offerings have found that this is an area that constantly needs to be revisited – especially in cases where testing occurs. Some agencies and organizations have documented that testing with qualified proctors at remote sites is often not available, and thus causes problems in obtaining accurate results.

Data collected from students involved in the MST distance education courses paints a success story, but also one much in line with the research on distance education. Findings indicate that students who are off campus perform just as well, if not better, than the students who are on campus. This is an important factor for continuing to offer such courses in this manner, as well as revising the presentation and delivery of such courses.

Offering courses through distance education is not just a "fad" in higher education. With the technological revolution upon us, we are faced with a means to make advanced studies available for more individuals. For one institution, MTSU, this avenue has helped support a number of teachers in improving their teaching and learning of mathematics, as well as maintaining a strong graduate program that continues to grow.

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Use of Asynchronous and Synchronous Conferencing Tools: Implications for Teacher Practice

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Abstract: A comprehensive understanding of online learning, tools and instructor practices can contribute to a much-needed knowledge base for effective planning and implementation of successful learning. This paper presents the implications of facilitating asynchronous and synchronous tools on teacher practice. The instructors have taught and applied these tools in a *Technology Applications in Education* course in which one instructor used asynchronous discussion tools and a weekly student online journal in her undergraduate classes and the other instructor used asynchronous and synchronous tools in her online classes with undergraduate and graduate students.

Introduction

Developments in computer technologies have opened ways for the redesign of teaching and learning. Online education is a new area promising active, self-regulated and reflective learning. When properly designed, the online learning environment can promote collaborative learning; improve interaction and participation supporting learner-centered rather than teacher-centered learning. The use of asynchronous and synchronous discussion tools has gained attention due to their potential to provide rich learning experiences and interaction among students and instructors. These tools have commonly been used to enhance collaboration, critical thinking, knowledge building, to create learning communities and to provide a means for the online instructor to develop active learning environments.

Research and literature on asynchronous and synchronous discussion focus on discourse analysis, type and quantity of interaction among the participants, instructional strategies used when implementing these tools as well as the roles of the instructor and students (Ashton, Roberts & Teles, 1999). The question remains as to how does the use of asynchronous and synchronous tools change teacher practice in the online environment? Teacher practice in planning and implementing instructional strategies plays a significant role in online learning success. This paper presents the implications of facilitating asynchronous and synchronous tools on teacher practice.

The Study

The instructors applied asynchronous and synchronous tools in their *Technology Applications in Education* courses. Sections of *EDCI 203 Technology Applications in Education* or *EDCI 532 Technology Applications in Education* (graduate equivalent) are required of all students pursuing a degree in the College of Education at a Midwestern University. In the past, the courses have been offered in a traditional setting. In 1999, 2000, and 2001 a section of each was offered each quarter online due to increased enrollment demands. In hopes of developing a learning community, the instructors decided to use the asynchronous and synchronous tools provided by the University. The instructors felt that this might help to simulate the same discussion practices, collaboration, interaction and feedback often found in the traditional classroom and alleviate the concerns about building a classroom community. The discussion tools included as part of the course were

synchronous chat (1999, 2000), discussion board (1999, 2000, 2001), listserv (1999, 2000, 2001), email (1999, 2000, 2001), and electronic journals (2001).

The participants from the courses were divided into three groups in which a qualitative case study method was used to examine each course as a complete data source. All asynchronous and synchronous tools were provided to all faculty at the university in the development of online courses. The software used by this university was CourseInfo 3.0 and Blackboard 5.0 (www.blackboard.com). The instructors continued to use Blackboard set of software tools provided by the university in order to maintain continuity of tools/software throughout the study. The participants were grouped in the following manner to create a coherent understanding of the differences among the groups:

- Group 1 participants were graduate inservice teachers and used the chat, email, listserv and discussion board as their asynchronous and synchronous.
- Group 2 participants were undergraduate preservice teachers and graduate inservice teachers. These participants used email, listserv and discussion board as asynchronous tools.
- Group 3 participants were undergraduate preservice teachers and used a virtual café, email, discussion board and electronic journals as their asynchronous and synchronous tools.

Data was collected from the following course sources: email between student and instructor, email between student and student when possible, chat archives, listserv archives, discussion board entries, and electronic journals. Data collection was ongoing and continued throughout the study. Instructors maintained a reflective journal of their concerns and changes during the courses as well. An examination of the chat, email, listserv, discussion board conversations and students' weekly online journals offered opportunities for the instructors to evaluate and reflect on their own practice. All sources were evaluated and coded for common themes.

In an examination of instructor practice the following activities were noted. With Group 1, the instructor used both asynchronous and synchronous tools in her class that included a discussion board, email, listserv and synchronous chat. Each week online office hours were held in which students could chat with the instructor and ask questions concerning course work and other concerns. Part of the online office hours were set aside for individual conferences and other times were for open discussion in the class or team discussions. Questions were posted to the asynchronous discussion board were used to check understanding and to encourage reflection and discussion of technology topics common to preservice and inservice teachers. Email attachments were used to turn in assignments or to ask for a critique of work in progress. A listserv was used to ask questions between the online chats or to distribute information that the whole class should see.

With Group 2, the instructor decided to not include the online chat in the development of the course due to access problems with the university software and technical server problems. The instructor continued with the use of the discussion board to check understanding and to discuss technology topics common to preservice and inservice teachers. The listserv took on a much greater role as it was used to discuss weekly concerns and team discussions. All communications were asynchronous in this term of the course.

With Group 3, the second instructor used the asynchronous discussion board and student online journals. The instructor created learning teams composed of three to five students. The discussion team size was kept small and students were put into similar or same specialization areas. The instructor had intended to create small learning communities in which students discuss and analyze issues and concerns that deal with their specialization areas in regards to technology integration. This instructor implemented an online journal to collect feedback and student reactions. *Minute Paper* format is an assessment technique to provide rapid feedback to the instructor (Cross & Angelo, 1988). Individual online journal areas were created for the students to give weekly feedback to the instructor's questions about the class and give suggestions in regards to what they are learning and the structure of the class.

Findings

The use asynchronous and synchronous tools in online learning have implications on teacher practice. These implications are pedagogical, social, managerial and technological. There were also differences found between graduate and undergraduate level concerning the implications of how they influenced teacher practice. When used appropriately, these tools can help the instructor to foster a learner-centered climate and allow the instructor to use a constructivist philosophy when interacting with students. Additionally, the teacher can facilitate these tools to check student progress and learning while continuous assessment and development of

the course. However, as well as appropriate use of instructional strategies, online teaching requires a great deal of commitment on the part of the instructor.

Pedagogical Implications: Teaching online requires design decisions that are appropriate to online learning. The instructors intended to enrich their students' learning experiences through asynchronous and synchronous communication tools and to build a learning community model. Utilization of these tools were determined by the instructor's pedagogical values and goals as well as the technical and technological capacity of these tools provided within the CourseInfo and Blackboard and other technology services at the University. The instructors made deliberate decisions on how to use these tools, how to provide feedback to the student(s) and how to obtain feedback from student(s).

When discussing the development of the courses and the use of the discussion thread the instructor of Group 1 and Group 2 had the following comments:

> *While the undergraduates prefer to work in groups and correspond with those in their majors, the graduate students want to hear and read everyone's answers it seems. I had originally thought that I would have everyone in small groups but the graduates complained that they wanted to know what the whole class thought about different discussion questions. While the undergraduates seemed content to be isolated, the graduates want to read everythihng.*

The Group 3 instructor put in her reflective journal when deciding upon the use of threaded discussions these statements:

> *I could have just created discussion questions for the whole class, but I thought by creating small groups that specialize in the same area, students are going to write issues that deal directly with their majors and they can learn from each other. I also would like to create a small learning community which they will share information with each other and ask questions to each other. The other reason I created small group areas is that when the data is too much to read as in the case the whole class posting info, this will create information overload and students will not tend to read each other's responses. In my previous [face-to-face] dass, I observed that students simply answered the questions. However, this could be just an assumption. The amount of interaction that might happen may depend on the type of the questions asked, the amount of moderation provided by the instructor.*

Discussion questions and weekly online journals provided ways for the instructors to get feedback from the students' and check student learning and progress. Instructors incorporated activities that emerged from student discussions and journal writings. For example, Group 3 instructor created a Frequently Asked Questions Area to answer student questions that emerged from student online journals and a Virtual Café where students can ask questions to each other and collaborated. Students offered suggestions and instructional tips in their journal writings.

Another implication of the online journal was that the format of the questions changed after the fifth week due to the feedback from the students. The students were initially asked to write what they have learned, what is remaining that they haven't learned and if they have any suggestions for the instructor. The students told the instructor that they were tired of answering the same questions. The instructor changed the questions to questions that dealt more directly with integration of technology. This allowed students to reflect on the issue of how they could integrate technology into their teaching rather than focusing on technical skills.

Implications for Management: The Group 3 instructor aimed to create collaboration among students in each undergraduate learning team. Three of the discussion questions required each undergraduate team member to be either an editor or a judge. Each time one of the team members gathered the information other team members posted and edited those and create a technology poster or list the issues pertaining to the matter in hand. This created quite a confusion among the students. They were confused about how to handle collaboration online. One student wrote in her online journal:

The only difficulty that I have had this week is about the discussion board question. It seems rather hard to talk with the group. We are all pretty busy and it is difficult to actually write this paper over the Internet without physically seeing one another.

The instructor received several emails or phone calls in regards to how the students were to do their editorial tasks. After the first initiative, the instructor had to revise the questions and redesign to simplify the tasks of the students. Another challenge for the instructor was to have the students respond to the discussion questions and to remember to write their online journals. The instructor initially had planned to use eight discussion questions spread to ten weeks during the quarter; however, it was decided to keep it at six since the students were getting overload by the discussion questions.

Social Implications: The instructors tried to create a friendly social environment in which students could ask questions to the instructor and to each other. Teacher presence, concern and acknowledgement of students are important aspects for creating a learner-centered environment. One of the strategies used was to email students for progress check in a friendly manner. They asked students how they are doing and how the class is going for them even if the students did not ask any questions. Bonk, et. al. (2000) suggests that social actions such as instructor empathy, interpersonal outreach (e.g., welcoming statements, invitations, and apologies), discussion of one's own online experiences, and humor can help foster a learner-centered climate.

Group 3 instructor used the online student journals to interact with the students as well as checking student progress and learning. It was observed that the students used the online journal as a way to connect with the instructor. Instead of emailing the instructor they asked their questions or made comments to the instructor within their online journal areas. The Group 1 and 2 instructor used the chat, email, and listserv to make student inquiry about student concerns and class issues. Students indicated on the course evaluations that the chat was the most interesting and had helped students connect to the instructor in a personal way.

Technological Implications: *The technology available, specifically the course management software had enormous implications on teacher practice. For example, the instructors had to post each discussion question to each learning team one by one. Also, the online journals had to be created individually one by one. This required the instructor to spend a great deal of time. The variety of levels within the software created the need to take more time in moving among the various parts of the software.*

Implications of Educational Level Differences: In examining the use of the different synchronous and asynchronous tools the instructors found the some interesting differences concerning not only the tools, but whether the participants were graduate or undergraduate students. Concerning the educational levels of the students, the instructors found that undergraduate preservice teachers approached the use of technology and coursework in very different ways. By in large the graduate inservice teacher asked more questions of the instructor in fact almost 2.5 more inquiries were made on assignments and critiques of work. The graduate inservice teachers were more likely to return to the synchronous discussion board and respond to each other's responses to the questions than the undergraduate preservice teachers. The graduate inservice teachers would ask each other for help by use of the listserv often posting questions of the following nature,

[Graduate inservice teacher to the listserv] Does anyone have an idea why my printer is not working? It keeps printing only the bottom half of the words. I have replaced the print cartridges and paper....and reset everything, HELP!

[Graduate inservice teacher to the listserv] What software is everyone using to complete assignment #7? Can someone tell me what she really wants us to do?

Not a single listserv question from the undergraduate inservice teacher ever asked a question of the whole class although they were encouraged many times to do so. The undergraduate preservice teachers would ask the instructor for individual help through personal emails.

The listserv was often used by the instructor of Group 1 and Group 2 to remind the students of upcoming deadlines. This often sparked a flurry of questions from the graduate inservice teachers and a sudden rush of assignments being sent. At times, it seemed that the reminders were the main prompts for questions and comments to the instructor by the graduate inservice teachers. They were very interested in asking fellow teachers about how they would handle an assignment.

This same attitude was also used in the asynchronous chat by the graduate inservice teachers. While the instructor would often begin the discussion or questions on the asynchronous chat, after about 10 minutes, the instructor found that the teachers would begin to ask each other questions and make comments about their teaching methods, schools, students and technology and only looked to the instructor for confirmation or another point of view. The chat was extremely lively with teachers [they did not know each other] discussing classroom issues as though they had known each other for years. Teachers would come in and out of the chat often leaving to take children to events and returning. The instructor began to have less and less of a role in the chat during office hours as the graduate inservice teachers took the lead in questioning and discussion.

With Group 2, the use of the listserv with the undergraduates had a very different outcome than was seen with the graduate inservice teachers. Seven of the sixteen undergraduate preservice teachers sent a message similar to the one below,

> *Dr. [Instructor], I have a syllabus and the assignment list with the dates things are due. Please do not send me anymore emails about when things are due. I can read the assignment list.*
>
> *I have a list of when the papers are due. Don't email me about this.*

Quite surprised by these statements, the instructor promptly made a note that the seven students did not want to be reminded of when assignments should be completed and removed them from the distribution list.

Conclusions

Graduates and undergraduate behave differently in the online environment. This behavior affects the way the instructor presents and distributes information. While the course content remains the same, the methods used to encourage students to participate and develop an online community must be carefully crafted to meet the characteristics of the online student. While the instructors had expected that the undergraduates would be very used to the online environment and chat or participate in discussions easily, that was not always the case. The undergraduates were more interested in finishing the course to meet a graduation requirement than participating in meaningful discussion for the most part.

In this paper, we attempted to describe the implications of asynchronous and synchronous conferencing tools in online learning on teacher practice. Online teachers need to be committed to be available to respond to students' questions and concerns and make the means for them to engage in meaningful learning. The teachers need to continuously check student progress as well as how they are doing while teaching online. Teacher presence is an importance issue for the students to feel they are not alone and everybody is a part of the learning process.

Online teaching is not simply posting assignments and discussion questions. It requires extensive planning and structuring and time. Online instructors need to be aware of the strategies and activities they can use with asynchronous and synchronous conferencing tools to engage students in active learning and to provide and receive constructive feedback.

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Title: Critical Issues in Distance Education
Type: Panel
Panel Members: Thomas Frizelle- graduate student, Jesse Drew – graduate school, Sara Rinkleff – graduate student

The purpose of this panel is to discuss relevant critical issues in Distance Education. Critical issues reach far beyond personal experiences and educational systems. For this reason, the panel will be composed of visiting scholars and Iowa State University graduate students. We hope to provide a diverse and international perspective on critical issues related to distance education.

What are some of the advantages and disadvantages associated with the increased offering of Distance Education classes? During our time we plan to focus on several salient issues related distance education: student learning outcomes, motivational issues, pedagogical considerations and instructors intellectual rights. Our panel will present qualitative and quantitative research and offer questions for reflection.

We hope to increase understanding and awareness with other IT professionals concerning the above critical issues in distance education. As instructional technologists, we are faced with a daunting task, which has an awesome responsibility associated with it: how to create educationally meaningful learning experiences for students using technology responsibly. As with any new technology, it is long after a technology has been introduced that it either reaches its full potential or falls to the wayside. We firmly believe that distance education, and other technologies, have not been fully explored and refined. It is difficult to speculate when and how this epiphany will come about. One thing is certain, instructional technologists must be cognizant of both the changes in practice and more importantly the changes in values which distance education and other technologies bring to a culture.

Faculty Attitudes Towards Distance Education: Enhancing the Support and Rewards System for Innovative Integration of Technology Within Coursework

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Abstract: Distance education is an area of rapid growth at the university level, especially within the colleges, schools and departments of education (National Center for Education Statistics, 1999; United States Distance Learning Association, 2000). However, there are some faculty who are not jumping on the bandwagon and are taking a more conservative route towards considering the impact of distance education within their courses attitudes towards distance education: early innovators; hangers-on (late adopters); and, negative withholders (resistors) (Robinson, 1996). Each of these groups have concern not only for their students and the appropriate learning environment for their subject matter expertise, but also a concern towards the university rewards system.

Introduction

Since faculty members are key ingredients to both creating and teaching distance education courses, there is a need for research concerning faculty perceptions about distance education, and which factors could influence faculty participation. As postsecondary institutions expand distance education courses, it will become even more important to determine what motivates and inhibits faculty to participate in distance education.

The survey in this study originally consisted of several studies combined into the original survey and validated by Dr. Kristin Betts at George Washington University (Betts, 1998; Hunt & Crawford, 1999). This survey differed, however, in the dissemination of the surveys by sending the surveys to faculty electronically, using email listservs, and by establishing an Internet website to collect and gather data from respondents. Through the adaptation of the surveys to an electronic format, the study had the opportunity to provide the participants with electronic surveys, tools that reflected the technology of the study.

Rewards System

The rewards system, both written and unwritten, are of primary importance to faculty and their attitudes towards distance education. Types of rewards may also play an important part in how faculty responds to using and integrating technology into their

courses. So, while part of the concerns of faculty may be due to the time and energy required to focus upon the instructional design process (analysis, design, development, implementation, and evaluation), other concerns that may have stronger effects upon faculty members' efforts may be going overlooked, reasons like tenure consideration and the efforts expended incorporating technology that are often overlooked in designation of tenure.

As is well known, each of the three aspects leading to tenure are of utmost importance, teaching, research and service, with the research, publication and grant writing elements being highly prized. The instructional design process that must be focused upon distance education takes valuable time and energy away from the traditional rewards system and, therefore, is of concern to both tenured and untenured faculty. A thoughtful revamping of the university rewards system concerning innovations and instructional design concerning distance education elements integrated into university coursework must be considered. A focus upon faculty attitudes towards distance education, the traditional rewards systems concerning tenure-focused faculty, considerations towards revising university rewards systems concerning tenure-focused faculty, and how innovative technological integration within university coursework may be rewarded within the university rewards system are addressed. Mixed research methods were used, incorporating both quantitative and qualitative data obtained from a dissertation survey conducted at a large urban southwestern university by one of the researchers in this study.

Faculty Motivation and Distance Education

The dissertation data used in this study divided the data into two categories of faculty motivation: internal and external, to see which motivators encouraged or inhibited faculty member's use of distance education. Internal motivators included encouragement, team spirit, and collaboration. External motivators included tenure consideration, merit raises, compensatory time, and other types of external rewards.

This research study surveyed faculty to determine if factors such as academic division (school or college), age, gender, tenure-track and non-tenure-track status influence faculty participation in distance education. The study also examined whether other factors might motivate faculty members to participate in distance education or inhibit/deter faculty members from participating in distance education.

Research on motivation indicated that currently many universities uphold a "public relations" approach to participation by administration and faculty, or a top-down management style of information dissemination to faculty (Paul, 2000; Stribiak & Paul, 1998). This type of management style attempts to appeal to the intrinsic motivators to faculty members, but can create hygiene (negative) factors that can inhibit authentic participation (Herzberg, 1986). The "public relations" approach maintains: one-way communications; the status quo for existing arrangements; defining the citizen/employee as dependent consumer; and defining the educator as an autonomous professional (Anderson, p.576). Administrative interest in the needs of faculty and efforts to assist faculty and meet those needs could be helpful in establishing a precedent of administrative collaboration with faculty (Gannon Cook, 2000). Authentic participation

consisting of positive rewards, collaboration and team building could then build upon the foundation of collaboration and trust established with administration and faculty.

Distance Education

Distance education operationally defined for the purpose of this paper is "a planned teaching/learning experience that can incorporate a wide spectrum of technologies to reach learners at a distance and encourage learner interaction (GannonCook, 2001)." Distance education can be taught: in face-to-face (f2f) formats at remote sites; in instructional telecommunication formats; using computer-based technology, like the Internet, listserv(s), e-mail, cable TV, interactive CD-ROM programs; using other technology like telephones, faxes, videotapes, audiotapes; or using little or no technology at remote sites (Gannon Cook, 2000)."

Authentic Participation

Authentic participation can go a long way towards engaging and retaining faculty because if they know the commitment is there and is evidenced by multiple examples of what the administration is willing to do, the faculty members will be more willing to meet them somewhere between the extremes of each side. By demonstrating the support of the administration, by nurturing activities, and by providing a venue for faculty voice, the faculty knows that authentic participation is really taking place and is not mere rhetoric. But extrinsic motivators have a growing influence on faculty members, particularly with respect to the use of distance education. Tenure consideration had a top priority to those faculty members still in contention for tenure status. Other motivators like increased salaries, monetary stipends, and compensatory time, all contributed to the increased motivation of faculty members participating in the survey (Gannon Cook, 2001).

Future Trends

The trend of institutions offering DE courses will continue to expand due to increased consumer demand and cost-efficiencies offered by this type of course delivery. The review of literature revealed that factors that most influenced faculty to participate in the creation and instruction of distance education hinged on motivation, both external and internal. Many faculty already carry full or overload teaching and administrative workloads, so it is difficult to persuade them to carry additional work for distance education courses without some type of external compensation (Gannon Cook, 2000). External compensation for faculty could include additional money stipends, royalties, course releases, tenure consideration and faculty voice in decision making-policies. Recent studies suggest that, while internal motivation can be inspired, particularly by department chairpersons and deans who have taught distance education courses, and can be inspired by participating in design teams, the pride of accomplishment often does not

sustain continued distance education instruction without the reinforcement of some type of external motivation.

Conclusion

While there are still many challenges and issues to designing and offering distance education courses, it seems unlikely that the trend for distance education will abate at any time in the foreseeable future. The research on faculty motivation and which factors can influence participation in distance education will become increasingly more important as the demand for these courses continues to burgeon. Future research is recommended in order to track trends and to gather new data pertaining to faculty motivation and which factors influence participation or non-participation in distance education.

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Motivating Students with Interactive Web-based Learning

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Abstract: As a fastest growing branch of distance education, Web-based learning is attracting more and more people. Interaction is an important factor that affects the learning process. It not only affects the learning effectiveness, but also the learner's motivation. To investigate the learner's motivational perspective of web-based learning materials, a posttest-only experiment was performed. The results from the experiment showed that college students who went through web-based learning materials implemented with elaborated immediate feedback outperformed those who learned the material through the regular website in the IMMS test. The interview data also supported the above conclusion.

Introduction

The World Wide Web is attracting more and more people and increasingly used as a medium to deliver instructional materials. Web-based learning is becoming a fastest growing branch of distance education. Many courses have been developed and distributed through the web. However, a significant number of web-based courses are predominately designed to transmit information to the learner and lack interaction (Alessi & Trollip, 2001).

As an important factor that affects the learning process, interaction not only influences the learning effectiveness, but also affects the learner's motivation. In web-based learning environments, there are three types of interaction: students interact with instructors; students interact with other students; and students interact with the learning content (Moore, 1989). In the learning process, interaction can be used to confirm if the desired learning happens; provide inquiries asking for additional materials; navigate through the learning materials; and combine existing knowledge with new instructional content. Many means have been used for the first two types of interaction: email, listservs, chatrooms, bulletin boards, and audio and/or video conferencing. However, studies focusing on student-content interaction in web-base learning environments have not been found in the literature. Many strategies can be implemented into the learning materials to increase the interaction between the learner and the learning content and to motivate the student learning. One of them is to use immediate feedback. By integrating immediate feedback to the learning process, the web-based learning material becomes more interactive and motivates students' learning. This study investigated the motivational effects of elaborated immediate feedback in a web-based learning environment.

Study

In this posttest only experiment research, student's motivational perspective of web-based instructional materials was examined through an Instructional Material Motivation Survey (IMMS) (Keller, 1999). To have a deep understanding of learners' attitudes toward the learning materials, an interview was also conducted after the learner finished the experiment. The subjects in the study were college students in various majors. The learning content is about copyright rules and principles, which is a very important topic for pre-service teachers. The control group went through the learning material presented in a regular website, which provided limited interaction between the learner and the learning content. The experimental group went through the learning material presented in a website which integrated elaborated immediate feedback strategy. In this group, the learner could interact more with the learning content by following the provided feedback information.

Findings

The data collected through the IMMS and interview were analyzed with statistical procedures. The results showed that students in the experimental group outperformed those in the control group in the overall IMMS test. The ANOVA test indicated that the difference between the two groups was statistically significant. The analysis of the four subcategories of IMMS also indicated that the learning material embedded with elaborated immediate feedback was more attractive, and the students in the experiment group felt more satisfied with their learning. The data from the interview also supported the above conclusion. All the interviewed students expressed very positive attitudes toward the embedded immediate feedback strategy. They thought that strategy motivated their learning, provided helpful information to lead them to review their learning, and reinforced what they learned. Therefore, it can be concluded that immediate feedback can motivate students' learning in the web-based learning environment.

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Semantic Knowledge Factory: A New Way of Cognition Improvement for the Knowledge Management Process

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Abstract: The goal of the novel tool HERMA (enHanced E-learning Repository MAnager) is to improve the efficiency of the knowledge transfer process in web-based learning environments. The mechanism enables users to improve adaptive courseware enlargement and it supports the dynamic retrieval of the content, its presentation and navigation. Based on self-defined semantic parameters, which describe course and user specific factors, it generates dynamically context dependent, user relevant and always automatically updated background knowledge that relies outside the static repository by applying a smart search framework. HERMA places this dynamically generated background knowledge at the disposal of learners across distinct viewing modes while navigating through the courseware. In addition, HERMA may improve the process of course generation and maintenance. In our first application, HERMA is integrated in the Hyperwave eLearning Suite and interacts with the smart search framework xFIND.

Motivation

At the IICM we had long-term experiences in the fields of web based learning systems, for example (Dietinger et al. 1998b), hypermedia management systems like (Hyperwave 2001), dynamic background libraries, as stated in (Dietinger et al. 1998a), and knowledge discovery, as with (xFIND 2001). The praxis showed that within the learning process the sole application of a static course repository is not sufficient. This led us to propose that one of the key issues of modern web based learning systems is to reach a dynamically enhanced knowledge transfer.

The knowledge transfer process could be interpreted as a holistic phenomenon composed of two, mostly overlapping but essentially different, main streams: a) the teaching process, which concerns knowledge generation and delivery, and b) the learning process, which concerns knowledge acquisition. A wide range of problems caused by a huge and an increasing amount of information as well as by rapid changing knowledge are faced within both processes. A selection of those problems is discussed as follows.

Knowledge in virtually any subject is a dynamic entity itself. According to (Lymann et al. 2001) each year a dramatic amount of 1.5 EByte of unique information is produced worldwide. Course authors and learners have to keep up with permanently increasing and changing knowledge. Thus, a mechanism should be given to support trainers in gathering new knowledge and tracking the modifications. Learners should get informed dynamically of this up-to-date background knowledge during their learning process.

Another problem is that nested hyperlinks in static documents often lead to no longer reachable resources. A survey of hyperlink sources in research papers has shown, that some 20-30% become invalid links within one year (Lawrence et al. 2001). Thus, the delivery of content with embedded linkages should happen in a semantic and adaptive way. The system should provide an adaptive extension of the static repository for example by defining an itemized semantic-based background library. Furthermore, the system should ensure relevance, actuality and reliability of this background knowledge. This can be achieved by collaborating with a smart search framework, like xFIND.

The learning process is a not always predictable user dependent entity. Current systems provide distinct "adaptive" features to deliver user-tailored content. We propose that adaptive and goal-oriented knowledge generation and delivery should be supported in web based training systems in order to define semantic topic maps and to assign user expertise levels. This enhances the responsiveness of the system in order to reach a wider target audience. Our former experiences in user behavior within the learning process, as stated in (Pivec 2000), have endorsed that learners hold distinct learning methods. Some prefer to get informed of background knowledge directly within the content of the course, for example through embedded hyperlinks. Others prefer information at the end of each chapter, and so on. Thus, a mechanism to provide adaptive presentation alternatives for the dynamic background library should be enabled.

Furthermore, trainers should have the possibility to specify grouped topics that describe different background knowledge resources in accordance to the skills of learners. In addition, learners should get the freedom to define their own expertise level, to personalize their view of the dynamic background library and add their own sources of information.

Based on the motivations, facts and problems stated above we have set up a prototype implementation called 'HERMA'. The enHanced E-learning Repository MAnager HERMA may be seen as a smart dynamic background library that transparently monitors all the features to solve the problems described above. Thus, it improves most of the needs of trainers and learners within web based training systems. An optimized adaptability is reached due to its gradable features and its permanent presence through the entire knowledge transfer process.

State of the art

As Peter Brusilovsky stated in (Brusilovsky 1998), we advocate the criteria of assessing adaptability within web based training systems on dependence of the provided or absent adaptation technologies. A survey in the field of pre-existing learning environments as well as present research work led us to emphasize that current systems do not meet the needs of trainers and learners for adaptive technologies. Annotations, chat rooms, asynchronous messaging, dynamic navigation, personalized study spaces, courseware delivery platforms, curricula sequencing, progress tracking, static library and glossary, internal search functionality, virtual references, adaptive collaboration, meta descriptors, topic maps, metadata servers as well as self-assessment features represent only some of the existing modules interacting in current on-line learning environments. Nevertheless, problems arise after trainers have already published their courseware. At this point they have determined their strategy to reach a specific didactical goal. In order to reach different target audiences with various levels of expertise, they should have to enlarge the courseware physically on the system storage.

A similar problem could emerge during the course attendance, for example if enrolled learners are not able to manage the delivered knowledge in the expected time or manner. Because of that, we propose that courseware as well as additional background information (background library) have to be provided according to learners' needs. HERMA solves these problems by exploiting novel features that allow constant reconfiguration and personalization of courseware and dynamic background library.

The static knowledge repository is the basic element of on-line learning systems. Apart of representing a static collection of ready-to-use digital materials, it should integrate an adaptive complement for assisting trainers and courseware authors while developing, presenting and maintaining the courseware according to the needs of learners and to the dynamically changing knowledge. This should happen all the time, during the whole teaching and learning process.

HERMA enhances the goal-oriented knowledge transfer process by enabling the development of a dynamically indexed background library of subject-relevant resources relying outside the static repository. Trainers may determine, after creating its static courseware, a set of topics referring to accurately described resources on the Internet. Relevance, actuality and access of this background knowledge are maintained

with the collaboration of the smart search framework xFIND.

The Basic Idea

The basic functionality schema of HERMA, as shown in (Fig. 1), depicts the different interaction layers and its dependencies through the knowledge transfer process. Background knowledge relying on the Web is dynamically accessed via the smart search service xFIND (exploiting Quality Metadata) according to the predefined items in the Semantic Knowledge Factory 'HERMA'. These items are essentially defined within expertise level groups and assigned to one or more course chapters. Thus, depending on the selected viewing, the requested page is dynamically generated and contains a list of valid items. Clicking on a delivered item, in (Fig.1) symbolized by the arrow 'Activation', will lead to a search call of xFIND using the pre-stored item specific query term. The final result is a set of accurate, relevant, up-to-date documents.

From the point of view of the trainers, HERMA essentially provides an option for determining a set of topic specific items, which refer to a dynamically generated set of resources provided by xFIND. Each item belongs to a specific level of expertise, may be grouped with other items to a specific 'subject' collection, may have synonyms - which should be referenced in the same way as the topic itself -, and has a scope of validity within the courseware. From the point of view of the learners, HERMA provides the possibility of choosing its own level of expertise and one of four different viewing modes for displaying the currently valid elements while navigating through the courseware.

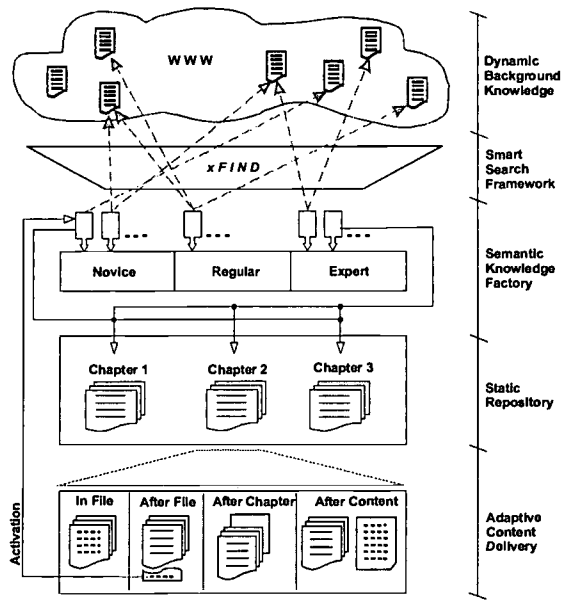

Figure 1. Basic Functionality Schema of HERMA

Prototype Implementation

The implementation of HERMA runs fully integrated in the Hyperwave eLearning Suite system, works hand-in-hand with its data base objects (courseware and users stored on the Hyperwave Information Server), and accesses background knowledge from the Internet intercommunicating with xFIND. When learners demand a page of the static repository, HERMA dynamically parses it applying a smart pattern matching mechanism. It remembers each valid occurrence of the predefined items and delivers the content according to the personalized learner settings. An item within HERMA is defined as a combination of: a) descriptive information about a topic, which is stored as an xFIND specific query term, and b) metadata about the meaning and validity scope of the topic definition within the training system.

Trainers assign each item a user-specific expertise level. The name of the item is simultaneously the name of the Topic, for example 'Internet'. Some Topics may also be collected in self-defined super-ordinate sets called Subjects, for example 'Information Technologies'. After determining via (xFIND 2001) a satisfying list of accurate information from the Web, the xFIND specific query terms are stored within HERMA. These terms represent the semantic retrieval of background knowledge and ensure always up-to-date information from the Internet. Trainers define also the scope of validity for each Topic (one or a set of course chapters for which the topic is valid). A set of Synonyms corresponding to the Topic may also be defined, for example "Intranet". Thus, the presentation of the semantically itemized background knowledge depends on the intention of the trainers and on the personalized learner configuration.

Learners may not only choose an expertise level but also one of the four provided Viewing Modes that are shown in (Fig. 2) and explained as follows: a) Embedded hyperlinks: the content of the demanded page is parsed and modified dynamically depending on the current settings. Each match is highlighted and hyperlinked to a proper xFIND-specific search request. This is shown in (Fig. 2) by the word INTERNET and its Synonym INTRANET (identical hyperlink information stands behind the icons beside those terms). b) End of page: A list of the matching items is appended 'at the end' of the page. In the example of (Fig. 2) both, the topic Internet and its Synonym Intranet, were found. Therefore, the corresponding Topic name is contained in the List of items immediately after the content. c) End of chapter: single pages are not modified. At the end of each chapter a dynamically generated HTML page that contains an alphabetical list of the chapter and level-specific items is provided. d) End of course content: a dynamically generated HTML page with a list of all level specific items is attached at the end of the course.

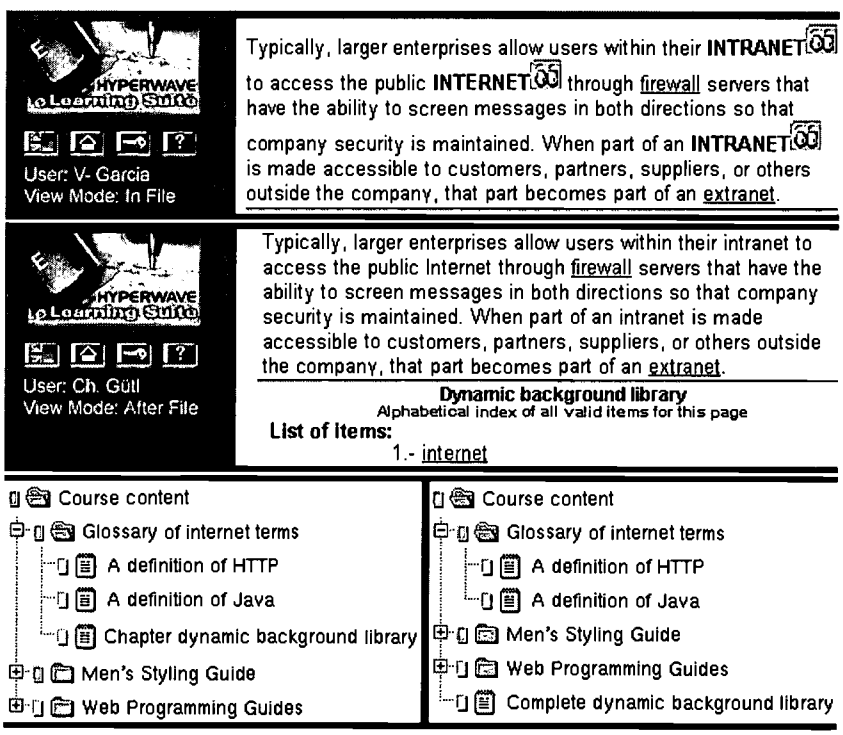

Figure 2. Adaptive Presentation and Content Delivery with HERMA [Top: Embedded hyperlinks - Middle: End of page - Bottom Left: End of Chapter - Bottom Right: End of Course Content]

Conclusion

As shown through the paper, HERMA enhances dynamically the functionality of static repositories by providing smart features that improve accuracy, actuality and goal orientation of static courseware. The prototype implementation of HERMA has been successfully tested for the course

'Knowledge Management' at IICM, Graz University of Technology. Further research and development work will update HERMA's functionality. Thus, a learner may not only use one global Semantic Knowledge Factory, but develop a personal one or share a self-defined one within a group of course participants. It is also planned to integrate HERMA in large distributed systems, where users of different environments, like universities, may mutually manage a multi-server Semantic Knowledge Factory.

A semantic-based dynamic mechanism with various interactions, as implemented with HERMA, assists trainers, publishers and learners along the whole knowledge transfer process: it assists actors during knowledge creation, structuring, delivery, maintenance, personalization, reconfiguration and acquisition. Knowledge delivery is adaptable to users' needs without overloading system capacities. The separate treatment of delivery and storage of knowledge makes the system flexible, reusable and cost effective.

The smart reconfiguration feature of HERMA makes it possible to gradable conduct the activities of learners during the whole knowledge transfer process. This enhances the teaching process by means of an improved guided learning.

As stated in this paper, HERMA applies a smart pattern matching mechanism to each topic definition - and to its corresponding synonyms - during the content delivery process. This simple idea enables a single HERMA environment to manage also systems that support multilingual content delivery, by associating topic definitions with synonyms in different languages.

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Rhetorical Approach to Assessing Online Discussion

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Abstract The purpose of this paper is to assess the fruition of online course discussions by analyzing the transcripts of these interactions for a graduate survey course in economics. The method used to conduct the study is unlike other works in that it is lexical in nature. Dictionaries are used to develop quantitative measures of the linguistic characteristics of the online conversations. These rhetorical facts are used to assess the linguistics of general course discussions and a specific team discussion.

Introduction

A key element in successful online learning is full and fruitful participation of learners in group discussions. These collaborative forums provide the basis for devising shared goals, encouraging comments, using the semantics of the subject area, developing critical thinking skills, providing personal examples, asking questions, lending support to others, sharing responsibility for completion of assignments, and promoting feedback. Online discussions provide a means of enhancing cognitive skills as well as a method for assessing learning outcomes.

In these respects, online discussions are dynamic processes that develop over the life of a course. Knowledge is constructed in these collaborative forums through the process of social negotiations among the discussions' participants. Therefore, recognizable advancements in social and cognitive skills should be evident in the degree of content sophistication and the level of perspective taking by the learners. Various authors have characterized this collaborative learning process in different ways.

For instance, Jarvela & Hakkinen (2000) describe web-based discussion as an ontogenetic process. They use the five stages of Selman's model of social cognitive development to portray the evolution of online course discussion.(Selman, 1980) Palloff and Pratt see online involvement as ideally evolving from initial dissonance to content mastery and then to transformative learning (Palloff, 1999). The cognitive analysis model of Henri (Henri, 1992) is built around four dimensions of interaction ranging from social interchange to revealing metacognitive skills. Gunawardena, Lowe, and Anderson (Gunawardena, 1997) theorize that the active construction of knowledge in online discussions moves through five phases. Rourke, et al (2001) considers the issue from a model of community of inquiry. In this model, deep and meaningful learning occurs through the interaction of cognitive presence, teaching presence, and social presence. Others (Bonk, 1998) approach the development of online course discussion in the context of Bloom's cognitive taxonomy. With the sophistication of learner questioning evolving from the lower stages of cognition to the synthesis and evaluation levels.

The aim of this study is to use this rhetorical information to shed light on several important questions.
1.Does the character of the discussion change over the life of the course? Does the linguistic nature and tone of the conversation change as discussions develop? Is there linguistic evidence of moving from low-level discussion to deeper collaborative synthesis?
2.Can generalization be made about communality, accomplishment, optimism, and understanding from the rhetorics of the discourse? Are there key indicators of conversational sophistication?
3.Do the linguistics of the messages reveal anything about the learners and the learning process? Can linguistic indicators suggest anything about conversational sophistication of individual learners and about the entire class?

Methodology

This paper uses Diction 5.0 ([Hart, 1999) to analyze the content of the online discussions. This lexically based program searches the content of online discussions for five semantic features as well as thirty-five sub-features. Each semantic feature is scored on the basis of thirty-five sub-features (dictionaries) according to a series formulas incorporated into the software. The online discussions are compared to forty standard dictionaries and word lists in segments of 500 word. For discussions exceeding 500 words, the overall scores are the average of the individual 500 word segments. Custom dictionaries on microeconomics, macroeconomics, noted economists, and mathematical terms were also included in the database. No terms are duplicated between these dictionaries. The noted economists dictionary is a list of surnames of famous individuals in the evolution of economic thought. The mathematics dictionary includes basic mathematical terms used in the construction and discussion of economic models. The custom dictionaries focus on word usage in contrast to calculating a specific score.

Sample

The sample for this study includes thirteen graduate students in an MBA prerequisite course focusing on the fundamental principles of economics. None of the students had taken the principles of economics as undergraduates so this was their first formal exposure to the material. Three discussion forums are analyzes in this paper. The combined scores on participation in the forums counted twenty percentage of the students overall grade. The forums dealt with assigned topics. The first one center on an article by James Fallows entitled "What's an Economy For?" which compared the economic structures of Western and Asian economies. The California energy crisis was the theme of the second forum. The third forum, which was somewhat shorter than the other two, focused the use of the Federal government surplus for tax cuts versus additions to the Social Security trust fund.

Results

The results of the study provide evidence of the usefulness of rhetorical assessment. The ambivalence, hesitation and oversimplification of the early discussion was proceeded by communality and optimism in the later group interactions.

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Reeducating the Professor and the Student: Lessons Learned from Distance Education Classrooms

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Abstract: This paper is a report on the findings of a study conducted with graduate level students enrolled in courses delivered through the medium of real-time audio-video teleconferencing via the North Carolina Information Highway. The purpose of the study was to investigate the quality of distance education courses, to determine the effectiveness of the delivery medium, and to examine the respondents' perceptions of the instructional strategies implemented in these synchronous learning environments. Input from experienced teachers who were pursuing a graduate degree regarding the learning environment and pedagogical strategies offered valuable information to the researchers. Findings reveal much insight into how distance learning courses can best be delivered in synchronous learning environments.

Introduction

One of the questions in distance education that we continually attempt to answer is: what constitutes effective teaching in synchronous and asynchronous environments? In search of the answer, the fields of education and technology have studied student perceptions comparing online to traditional lecture class quality (Ryan, 2000), the achievement of students in distance education and traditional classrooms (Schulman & Sims, 1999; Dominguez & Ridley, 1999), demographics of students taking online courses (Guernsey, 1998), staff training needs (Connell, 1998), support for faculty teaching (Bremner, 1998), and community and team formation in distance education classrooms (Berg, 1999) and numerous other subjects. We have also examined traditional versus nontraditional roles for the teacher and new paradigms for on-line learning (Bourne, McMaster, Rieger, & Campbell, 1997; Shneiderman, Borkowski, Alavi, & Norman, 1998). The need still exists to examine the role of the teacher and effective strategies for effective teaching. As Shneiderman (1998) wrote, "technology can be wonderfully empowering for teachers and students, (but) the relationship between human beings is still the heart of the educational process."

Purpose

This study attempted to examine the relationship between teachers and students in distance education classes taught by university faculty from the college of education. Graduate students who were practitioners in various fields of education were the participants in these synchronous classes. It was anticipated that this pool of students would give insight into appropriate and inappropriate uses of various teaching strategies and techniques due to their expertise in education. A website with a discussion board was created to allow for interactions among students about: 1) the quality of learning, 2) effective teaching strategies, and 3) the effectiveness of the media of course delivery.

The Study

Conceptual Framework

The conceptual framework that serves as a philosophical basis for our institution posits that faculty and students come together as a community of inquirers to examine the aims of education and the nature of teaching and learning for achieving worthwhile educational goals. Teaching is viewed as a dynamic, goal-oriented, social activity, and learning is perceived as an active process of acquiring, assessing, and producing knowledge. We collectively embrace the exploration of new forms of teaching and learning through experimenting with emerging technologies. To this effort, we work as a community of practitioners who embrace the social constructivist perspective and encourage discourse from various levels of participants in solving educational problems.

The Participants

When the researchers in this study determined a need to engage graduate students in a collaborative effort to evaluate the quality of their leaming experiences from courses offered through distance learning, two groups of students were selected. These two groups of students consisted of majors from the field of instructional technology and elementary and middle grades education who were currently employed in their field of expertise. The technology majors were enrolled in the course *Planning for Technology in Education.* It is one of the advanced courses students must complete for a graduate degree and K-12 licensure in instructional technology in North Carolina. The course emphasizes the development of technology plans at local, school, and district levels. In addition, the issues and processes of successful grant writing are explored. This course was taught simultaneously to two groups of students at remote sites and one group on the campus. The remote sites had computers for each student, while the main campus site required students to use a computer lab located in another building. Each site had a technician to assist with the overall operational details of the teleconference. A web-based supplement was also developed for the course that included an orientation, daily outline and assignments, resources and a threaded discussion forum. The instructor for this course had previously taught with this delivery medium. The elementary and middle grades education majors were enrolled in the course *Connecting Learners and Subject Matter.* It is one of the required courses for all education majors for the graduate level degree. The course emphasizes effective strategies for ensuring student mastery of content. This course was taught simultaneously to two groups of students with one group on the main campus and the other section at a site approximately 90 miles away. Each site had a technician who assisted with cameras, sound, equipment, and trouble-shooting when the technology difficulties occurred.

The North Carolina Information Highway (NCIH) program used in this distance learning study provided video teleconferencing capability to universities and public schools across the state. The "Highway" originally established for video communication today serves as the centerpiece of the states high-speed data network, supporting the data, voice, and video needs of all government at the state and local levels as well as school systems and other public entities. Using the high-speed backbone of the North Carolina Integrated Information Network (NCIN), our NCIH services provide broadband connectivity and setup of on-site video conference rooms to support a host of point-to-point and multi-point conferencing applications, including the distance learning medium used in this study.

Altogether 73 students were enrolled in these two classes. The instructional technology majors were aware of the synchronous learning environment in advance. However, the students enrolled in *Connecting Learners and Subject Matter* were not informed in advance of the delivery system to be used. These students met for a sixteen-week semester and when the courses were complete, they were asked to provide feedback on their pedagogical and technological experiences. These students volunteered to participate in an open-item questionnaire that was designed to collect demographic data and feedback regarding the quality of their learning experiences in these distance education courses versus courses that did not involve this delivery system. Students also analyzed the effectiveness of teaching strategies used in these courses and the effectiveness of the NCIH. The survey was posted on a password protected website and required students to give permission for their comments to be used in a research study. Results were summarized and presented below.

Research Questions

Each graduate student enrolled in these two courses was invited to participate in a research project designed to assess the quality of the delivery system used in their class and to examine their perceptions of the instructional strategies used. The following questions were posted on a password protected website.

1. Contrast the quality of the learning experience in distance education courses versus on campus courses (interaction, instruction, assessment, etc.).
2. What teaching strategies have you found to be effective in distance education courses?
3. How effective was the medium for delivery of the class (ie. NC-REN, NCIH, web-based)?

Altogether 46 students logged onto this website and participated in this research project.

Findings

In the following narrative, the responses to the research questions are summarized. Specific quotes are used to highlight student perceptions.

Question 1

When students were asked to evaluate the courses delivered in synchronous environments using NCIH, the quality of instruction was perceived as high and being "as good or better than courses taken on campus." However, students reported a strong preference for the professor to be at their site and felt that "instructors should be required to spend equal time at the various sites. Students miss a lot by not having direct contact with the instructor." One student wrote, "...the quality of instruction is not diminished by the remoteness of the instructor and learner" and further stated, "We tend to work more cooperatively as a group because of the distance, therefore, depending on one another more." Another student commented, "Distance education is a good tool if all people included work together to make it successful. I don't believe it can be successful when the groups are looked upon as separate entities. We must be a whole."

Several respondents commented on the limitations of distance education courses. "The frustrations of the technological problems... made this class difficult and often non-productive," wrote one student. Statements such as the following were posted. "A few glitches occurred with the delivery because of the equipment." "Time was wasted due to technical difficulties." "As technology bugs are worked out, distance learning should improve." These comments appear in the final research question as well.

In summation, while students prefer direct instruction with the professor, many would not have been able to obtain a graduate degree due to living a distance from the university campus. The convenience of this delivery medium has "truly benefited" the majority of students.

Question 2

Graduate students were asked to reflect on the effectiveness of the strategies used in distance education courses. The majority of students commented that small group discussions and cooperative

learning activities were the most "effective strategies used by the professor." One student stated, "I believe that small groups discussing the topics and then coming together as a whole is the best strategy I have used." This use of instructional time allows students to "get things accomplished without the hassle if technological problems." Another stated, "Small group discussions kept the program personal and relevant." "The instructors were adept at encouraging students to pursue areas of interest."

One student commented, "Just like in a regular classroom, variety is key: Cooperative Learning, Videos, Power Point, Direct Instruction (providing that the technology is working). For two sites, it is effective to bounce questions back and forth so that you can get everyone involved and sharing." "Power point and the overhead were good to supplement direct instruction" because visual learners need additional support. Literature circles used in the *Connecting Learners and Subject Matter* class was cited as a "very effective strategy" also.

Least preferred by students were lectures and large group discussions. For example, "whole group discussion was limited to the technological difficulties" of having cameras and sound focused on the speakers.

Question 3

Determining the effectiveness of the NCIH delivery system was the purpose of the third question in this survey. Students enrolled in *Connecting Learners and Subject Matter* reported more frustrations with the delivery medium than their counterparts in the *Planning for Technology in Education* course. Technical difficulties such as "...voice delays, freeze frames, and just being down were common to our classes this term." Most students made comments such as the "...the NCIH was not successful in truly making the class a good learning atmosphere." "I know that the technical folks here worked really hard; however, we have experienced technical problems," and "NCIH has a lot of room for improvement."

To the contrary, students enrolled in the technology course said, "NCIH has worked well. We've only had a few instances when connections did not work. The biggest problem was that voices broke down often and at times the volume from campus was very low." One student reported that this delivery system had been used frequently and they had learned the value of flexibility." However, one of thee students questioned the amount of money the state invested in this technology saying, "It would be better to just have web-based courses." Another concluded that though there were technical problems, they far outweighed the safety concerns of having to drive 60 miles at night through winter weather, and the fee was affordable."

In summary, both groups of students see NCIH as a good idea that will continue to be a part of graduate level education.

Summary

Given the results of this research, it is clear that there are still barriers impeding the success of distance education such as technical assistance and failures of equipment. It is also clear, however, that educators can create an effective learning environment, one that is influenced, but not driven by the technological media.

Students who were knowledgeable about teaching strategies reported that two major approaches were most successful in the distance education classroom. First, a cooperative group approach was reported as highly effective, allowing full participation by all students regardless of their distance from the instructor. A more constructivist approach to distance education classes, where students actively take part as peer leaders and instructors, may improve student learning. Instructors need to take on the role of facilitator, to an even greater extent, making sure all students have a voice in the class.

Second, students reported learning best when small group discussions and direct instruction were employed as long as the instructors used active, interesting audio visual aids and were well prepared for questions and follow up interactions. Distance education affords an instructor the ability to influence a

greater audience, sometimes as many as three to four classes simultaneously. This advantage may require the instructor additional time in preparation and perhaps even a full rehearsal of lectures.

Finally, students still want face-to-face interactions with instructors. Faculty may need to creatively address this concern with two-way video office hours, make visits to off campus sites, or change student expectations of a traditional classroom.

Discussion

Teaching is a complicated task even in the most favorable of conditions. Teaching and learning in a nontraditional environment requires both the teacher and learner to modify how they interact. The instructional strategies employed in distance programs must be examined from the perspective of the learner and the instructor. Instructors must be apprised of specific guidance based on research. By studying the perceptions of classroom teachers in their roles as students, we can delineate good from poor practice.

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Using a Centralized Web Site to Support Distance Learners

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Abstract: Supporting students at a distance can be quite a challenge, especially for programs that are completely web-based. Many times instructors must be responsible for providing not only instructional information, but also direction for students regarding administrative, technical, and logistical matters, all of which must be communicated in a clear and comprehensive manner. This paper overviews general support needs of distance learners and demonstrates how the Instructional Technology Program at Virginia Tech created a centralized web site to support learners in its online program.

Support Needs of Distance Learners

An essential aspect of any distance education project is the support services available to the students (Abate, 1999; Gibson & Gibson, 1997; Peters, 1998). Krauth (1999) asserts that students enrolled in distance education programs need the same types of student support services that are available to on-campus students, but that distance learners expect the delivery of these support services to meet their needs for flexibility and convenience. She also notes that special needs arise based distance learners' isolation and the fact that they depend heavily on technology for learning and accessing resources. Abate (1999) states, "think of all the offices on campus, all of the services provided for traditional students. All of these should be considered and made available in some fashion for students studying at a distance".

An Online IT Program for Teachers

The Instructional Technology Program at Virginia Tech currently offers an online Master's degree for professional educators. Termed ITMA (Instructional Technology Master's Program), the initiative originates from the Center for Instructional Technology Solutions in Industry and Education. ITMA provides practicing teachers the opportunity to earn a Master's degree without the need to enroll in our on-campus program. In addition, the program is structured around a set of outcomes that are specifically geared to these nontraditional students; these outcomes are based on technology standards developed by the International Society for Technology in Education (ISTE), as well as by technology standards recently implemented by the state of Virginia for instructional personnel. In order for faculty to assess whether or not students have acquired the knowledge and skills outlined in these standards, the

students are required to create an electronic portfolio that showcases their work throughout the program. Every course that our online students take relates in some way to the development of this portfolio, and the development process itself provides a meaningful learning context for the acquisition of these skills.

Studio Support Services

The portfolio idea also provided the context for the development of the ITMA Studio as the centralized support system for our online students. The "Studio" name stems from a desire to create a metaphor for an art studio as a location where many resources are available for creative development. The home page features a graphical palette of links leading students to various support resources designed to help them through the program. The resources available in the Studio can be grouped into several categories: portfolio support, program support, and peer support. Portfolio support is the main focus of the ITMA Studio. The Portfolio link provides access to a wide range of information about the electronic portfolio, including a complete list of requirements, links to related standards, and examples of previous student portfolios. Other portfolio support options provided by the Studio are links to tools and tutorials that are specifically chosen to help ITMA students acquire and learn the technology that will assist them in the creation of their portfolios. The Tools section includes annotated links to a variety of software programs that can equip students for the development process, while the Tutorials section provides assistance for students who are learning to use these tools.

Program support in the Studio consists of a help area that provides contact information for all of the faculty and staff involved in the ITMA program, including instructors, administrative staff, and technical support staff. This provides the simplest of benefits for students by allowing them to access important program information in one place. If they misplace a phone number or email address they know to consult the Studio for the information. The Help section of the Studio also contains links leading to important sections of the Virginia Tech web site, such as the library, the email pipeline, and students' personal accounts. Virginia Tech allows students to perform a wide range of tasks without ever setting foot on the campus.

Peer support is the third category of support addressed by the Studio. The first way this is accomplished is by providing a gateway for students to share work amongst themselves. This gateway provides a link to every student's portfolio, which allows both students and faculty to easily access everyone's work. We have also provided a chat room in the Studio to allow for synchronous communication between ITMA participants, without the delays associated with email or discussion groups.

Through a combination of resources, the ITMA Studio is designed to meet our students' needs for flexibility and convenience. By providing portfolio, program, and peer support, the ITMA Studio endeavors to be a place where students can resolve problems, develop their skills, and find social support at any time of the day. It is hoped that with the benefit of these resources each student will be able to create his or her own electronic "masterpiece."

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The Professional Development Series: Web-based Staff Development for K-12 Teachers

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Abstract: Marshall University's Graduate School of Education and Professional Development has successfully offered a series of staff development courses for K12 teachers using the Internet for course delivery. Teachers may apply, enroll, and complete the courses in an online format. The courses are structured around a series of informative and timely topics pertinent to today's teachers. Participant response to this program has been highly positive as exhibited by the exit surveys.

Introduction

The Professional Development Series was initiated during the Spring 2001 semester for the purpose of providing staff development courses to in-service teachers across the state. Courses are web-based (using WebCT as the delivery platform) with no face-to-face class meetings. One course was offered during the first semester as a pilot for the course development, marketing, registration, delivery, and evaluation procedures. The program was expanded to include three courses during the Summer 2001 semester and four courses during Fall 2001.

All courses offer three professional development credits that teachers can use for recertification or "plus hours" for advanced salary classification. Courses are graded as Satisfactory/Unsatisfactory. Content is geared toward providing teachers with practical applications that can be integrated into their classroom instruction. The current selection of topics includes: Using the WWW, Web Design, Literacy, Character Education, and Multicultural Education. Approximately 350 teachers from 49 out of 55 counties and three other states have participated in courses during the first three semesters.

Getting Started

Course offerings are advertised using a variety of formats, including: direct mailing to school superintendents and principals, faculty senate personnel, newspaper and newsletter advertisements, and the Series website, developed for the Fall 2001 semester.

Initial inquiry by students is completed by phone, e-mail, or online. Registration is completed by mail or online. Once registration is processed each student is mailed a Welcome Packet that includes a letter from the instructor, an assigned username and password, course login directions, and a tip sheet with suggestions for increasing success in an online course. The eight-point tip sheet was added after the first semester pilot was completed. These tips will be shared during the presentation.

Course Setup

All courses in the Professional Development Series begin with an orientation module designed to familiarize students with the course setup and navigation and to introduce the use of the course communication tools that are essential for discussion and assignment submission. Some of the most popular course tools include mail, discussions, student grades, quizzes, presentation area, and content module—all built-in to the WebCT interface. As part of the orientation module, students complete practice assignments that require using mail to announce that they have started the course and using Discussions (the Bulletin Board component) to post a brief bio.

Since the registration period for each course lasts four to five weeks during the beginning of each semester, students begin and end the course at different times throughout a semester. To facilitate this open enrollment period, all assignments are self-paced. This self-paced approach is also intended to accommodate the busy schedule of the typical classroom teacher.

Course materials and assignments include readings, interactive practice exercises (quizzes), online discussions, and independent projects. The focus of each course is on practical applications of content within the K-12 instructional setting. Examples of the Orientation Module and the organization of course content and assignment pages will be demonstrated during the presentation.

One or more instructors, depending on student enrollment, are available to facilitate each course. The course instructors are available to answer questions, facilitate online discussions, and evaluate assignment submissions. The target policy is to respond to inquiries and assignments within 48 hours of submission. Instructors for each course provide students with ample feedback and opportunity to make corrections to any assignment submission that does not meet the Satisfactory requirement.

The final component of each course is the Exit Survey.

Exit Surveys

Nearly 280 teachers participated in four courses during the first two semesters. Of this number, 260 participants completed the Exit Survey. The Exit Survey is intended to serve two major purposes: 1) evaluating course quality and 2) gathering information for future program planning. Items include:

- The course content was applicable to my professional development needs. (Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree)
- The assignments were relevant to the course objectives. (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree)
- The directions provided throughout the course were clear and helpful. (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree)
- The instructor(s) for this course were responsive to my questions and assignment submissions. (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree)
- Approximately, how many hours did it take for you to complete the course? (5-10 hours, 11-15 hours, 16-20 hours, 21-25 hours, 26-30 hours, >30 hours)
- Would you recommend this course to other educators? (Yes, No)
- Prior to this experience, have you ever taken a web-based course? (Yes, No)
- How did you hear about this course?
- If you are interested in taking other Internet-based courses, what topics would appeal to you?
- Please make any additional comments.

Results from the first two semesters (260 participants) are available and will be shared during the presentation. Ninety-eight percent of participants indicate Agree or Strongly Agree to the applicability of course content to their professional development needs. The remaining 2% were neutral. Ninety-four percent of participants indicate Agree or Strongly Agree with the responsiveness of course instructors to questions and assignments submissions, with the remaining 6% indicating Neutral or Disagree. One hundred percent of participants completing the survey indicate that they would recommend the course they completed to other educators. Additional feedback provided by students in the "additional comments" and future course topics has been equally positive and informative for course revisions and development of future course topics.

Conclusions

The need for quality professional development programs for in-service teachers is tremendous, especially for teachers who live and work in rural, isolated regions. Teachers who live beyond the standard service areas of colleges and universities deserve an equitable opportunity to participate in professional development programs. With the increasing access to Internet-connected computers in all public schools and with the expansion of Internet Service Providers into rural communities, online programs like the Professional Development Series can help bring the educational opportunities to teachers in all areas of the state.

CONSTRUCTING THE ONLINE LEARNING COMMUNITY: AN EXAMINATION OF READER RESPONSE AS A MECHANISM FOR SCAFFOLDING

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Abstract:

Studies on the pedagogical implications for integration of technology within teacher preparation courses are emerging in a time when national surveys (Milliken 2000, ISTE 1999) decry the lack of adequate teacher preparation in this area. This study examines the pedagogical implications for the use of Reader Response in an online post graduate methods course. The resulting benefits of technological, social, and cognitive scaffolding are the anticipated results and the specific methodology examines closely how these are achieved. The significance of this work is that it could be potentially used as a model for processing expository text in online learning communities thus increasing the learning experience.

Introduction

One of the criticisms of distance education is that it limits the students' education experience because of the anxiety and frustration due to the isolation inherent in the process. (Hara and Kling, 1999) Distress may occur while working on the Internet because of the complexities of working in isolation in regard to technological issues as well as course content issues. (Hara and Kling, 1999) This is indeed problematic as Brown and Duguid caution (1996) that learning does not occur independent of communities . . . Learning, at all levels, relies ultimately on personal interactions.

As a professor in a web-based distance education program, I work with students who have degrees and are seeking certification in teacher education through distance education. These nontraditional students are teaching on emergency certification or working in other jobs preparing to transition into teaching. Within these same classes, I also worked with students who have varying degrees of experience as teachers and are pursuing graduate degrees in education. Many of these students already are coping with the isolation of teaching and I want to alleviate frustrations and anxieties that potentially could affect their learning experience by designing courses I taught online with built in mechanisms for scaffolding student learning.

Framework and Review of Literature

Scaffolding in the learning environment is defined as the process of supporting students so they can accomplish tasks towards the higher end of the Zone of Proximal Development. This is "the distance between a learner's 'actual developmental level as determined by independent problem solving' and the higher level of 'potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.'" (Wertsch, 1985, p.67-68). Vygotsky described this as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978). This support can be provided through collaborative group work with more capable peers or through adult guidance. A great deal of scaffolding is provided initially, but is then slowly removed until the student is able to accomplish the same task on their own. An important aspect of scaffolding is that the task the student is asked to perform does not change to accommodate the learner. Rather, the learner is supported and guided until their schema have accumulated enough new information to enable them to perform the task on their own (Hodson & Hodson,1998).

The mechanism for scaffolding I chose to build into this course design was the use of reader response with expository text as the framework for online discussion communities. Based on the work of Louise Rosenblatt (1994), reader response is generally thought of as a literary practice, generally utilized within a language arts course. Rosenblatt theorizes that readers transact with text incorporating their personal linguistic experiential reservoir (1994) and their cognitive, affective residue of past experiences (1985) to construct meaning in text over time. Rosenblatt believes that the reader responds by means of the meanings he or she brings to the text, as well as by means of the meanings which emerge in the process of reading (Bertoff 1988). While my courses contained expository text, as opposed to the literature that reader response is more traditionally used with, I believed this method of processing the reading, when shared in community, might provide an opportunity for students to scaffold their learning.

Using Rosenblatt's theory of reader response with the expository text used in two teacher certification courses, coupled with opportunities for social interaction which connected students' thought and language in an online environment, I wanted to see:

1. If scaffolding of learning would occur as a natural outgrowth of this process
2. And if it did, what forms of learning support would it provide.

Methodology

The research design for this study is an action research project, which pursues action (or change) and research (or understanding) simultaneously through a cyclic process. This process alternates between action and critical reflection and the continuous refinement of methods, data and interpretation in the light of the understanding developed in the earlier cycles (Dick, 1997). The methodology chosen was a case study involving two post-baccalaureate and/or graduate level online classes. The department where this study was conducted offered a Masters in Education with an emphasis in Reading online and offered a series of five curriculum and instruction courses, which could be used towards a Masters in Education and/or in preparation for teacher

certification. The first author of this paper is the instructor for this course and the two co-authors, are teaching assistants. One of the coauthors, Frankum, has a Masters in Education and the other, Quintans, is pursuing a masters. Both coauthors are teaching in K-12 public education at the time of this study.

The data collected for this case study comes from four sources: documents related to the course, threaded message boards, e-mail, and student interviews. The course documents include the syllabus and online lessons. The online lessons contain directions for reader response discussions. They will be analyzed for statements that would encourage or discourage scaffolding. The last three sources will be analyzed initially for the elements of scaffolding as well as negative expressions and expressions of frustration.

Three sets of threaded message boards for each class are being analyzed. They were chosen from the threaded message boards from weeks three, seven, and eleven in the course. At this writing weeks three and seven were the only weeks available for analysis. So, this paper is an intermediate look at the data. After initial analysis of weeks three and seven by the three researchers, the following codes for analysis were generated:

1. Questions asked
   a. for clarification
   b. for support
   c. for a solution
2. Statements made
   a. supposing or imagining
   b. agreeing
   c. affirming
   d. suggesting
   e. offering a solution
   f. commiserating
   g. presenting a problem
   h. providing additional information (explaining)
      i. in the form of a story
      ii. in the form of metaphor or analogy
   i. correcting
   j. expressing an aha or a breakthrough
   k. expressing empathy
   l. expressing value or appreciation
   m. expressing resistance
   n. expressing a negative reaction
3. Exclamations
   a. of excitement
   b. of pleasure
   c. of value or appreciation
   d. expressing resistance
   e. expressing strongly negative reaction
   f. of encouragement

In addition, e-mail to the instructors in the form of student self-assessments for weeks three, seven and eleven are being analyzed for references of the elements of scaffolding or expressions of negativity or frustration which may connote non-scaffolding.

One month following the semester, each author will conduct three online interviews to ascertain the elements of scaffolding or examples of non-scaffolding perceived by the students within the reader response discussions in the course.

1. Has my experience with online reader response discussions influenced the way I think about learning? If so, how?

2. Does my experience with this online course contain any examples of scaffolding in reader response discussion? How did I scaffold my peers' learning? How did my peers scaffold my learning?

3. Has my experience with using reader response in an online environment influenced how I think about education and learning in general?

Data Analysis and Discussion

Four different kinds of data will be analyzed (document review, threaded message boards, e-mails, and interviews). The analysis will be triangulated in terms of methodologies, people, and time (Silverman, 1996; Stake, 1995). Furthermore, the informants will validate each interview transcript and interpretation. The three author/researchers will analyze data independently and debrief to analyze their results and draw implications and conclusions.

Document Review is the first kind of data analyzed. To invite students into the text in week three, I at first used guided questioning to help them tap into their existing schema and relate personal experiences to the concepts in the text. The following is an example of those instructions:

Questions to reflect on and respond to while reading.

Please note that this is challenging reading in that the language is complex and many times specific to the field of research. Try not to let this dampen your spirit, but read for general understanding and reflect on the main ideas. It is important that you read some of the discussion of the primary research in our field of literacy instruction and that you are familiar with the major researchers, their claims, and the research upon which they base their claims. Think of this as Popeye did his "spinach." It makes you strong in the field of literacy education. The discussion questions are designed to help guide you through this labyrinth of conceptually dense text. Please answer them in complete sentences in well-constructed paragraphs that have a topic sentence, supporting

points and a closing sentence. As a reminder, each WebBoard™ response plus follow-ups to two of your colleagues' postings and responses acknowledgements to all who respond to you are worth 5 pts per WebBoard™ session.

While the instructions did not open much space for reader response, but rather supported the reader through the text, the follow-up responses to colleague's postings did open that space and students began to question each other's experiences and ask for opinions.

The second kind of data analyzed was student responses to each other's postings. In Week Three, there were 16 original posts from 16 different students for a total of 58 student responses. There were 3.6 average responses per original posting.

The responses showed that the students were involved in the reading and communicated with their peers. Some students, 17%, asked questions such as, "How is it that the writing of the actual researchers has not called attention to policy makers that phonemic instruction is not proven to be the best reading instructor?" They synthesized the information gained from the articles and communicated their concerns with other students. For example, these were some responses to Chall, J., "Some Thoughts on Reading Research: Revisiting the First-Grade Studies" (1999).

Hi AG, Do you think that phonics is the great and wonderful phenomena that the First Grade Studies depicted it as being? ER

Do you think we are likely to see the same correlation of phonics to reading achievement as students move into later grades?

And students began to form opinions and take a stance.

I think they attacked the design to discredit the results as you stated in your question. If the design is flawed how can we believe in the results. I think people did not like the results of the research because it did suggest change. Change is always hard to do and some are not willing to do it. It differently takes effort and commitment. KP

This showed trust was being formed, and respect was beginning to develop. Approximately 50% of the questions requested clarification. For example LW writes:

P, Chall points out the decrease in reading achievement due to whole language but doesn't examine it anymore than saying it was because of the lack of phonemic awareness. She also leaves out some elements about her own research as you mention. Why do you think that is? LW

An additional 32% requested support. PW asks:

ER, I thought they really ignored the "other factors" that played a role in students' success, did you get that feeling too? PW
The rest, 18%, solicited a solution from their peers. For example KP asks:
I am a product of the 80's group that resulted in lower reading scores. I did not have formal phonic instruction in the classroom and I did learn to read and comprehend. But, I must say I still have a difficult time with phonics. I can not blame this all on the lack of teaching because I did have to attended speech as a child as a result of many ear infections and not picking up our language as an infant/ toddler. Do you think phonic instruction is vital to teaching a child to read? KP

Online statements made were analyzed. Of the statements, 23% were statements agreeing with their peers, and 14% affirmed what their peers had to share. In some students' responses, 13% proposed suggestions to their classmates.

In all honesty, I don't know why there has been this great debate raging for so many years. After all, if we want to achieve balance in our lives, why would we not want anything other than balance when it comes to educating our children? The balanced approach, as indicated by Bemiger, is the goal. ER

An additional 5% of the responses offered solutions.

I think part of the problem with all of this research is that we are researching readers. Readers are human, specifically, children, it is impossible to have a true control group. Furthermore, as we have all stated again and again, readers are individuals and in order for them to get the best instruction it must be individualized to meet their particular needs. LA

The same percentage of responses, 5%, commiserated with their peers online. Four percent of the responses presented additional problems in their posting. Twenty-six percent of the responses provided additional information by explaining or clarifying their position. An additional 5% told this in the form of a story, while 1% gave information in the form of a metaphor or analogy.

Corrections were offered in 3% of the postings, and 3% expressed an "aha" or a breakthrough.

While most of the postings were positive, 3% expressed resistance either to the reading or to the procedures they find in their schools.

Some exclamations, 8% of all responses, were made. Of those exclamations, half expressed excitement, 25% showed value or appreciation. For example KP writes:
That does make a lot of sense and I do agree with what you said about every student being a factor. This does help me understand Chall better. Thank you. KP

12% expressed resistance, and 12% expressed a strongly negative reaction. For example:
In retrospect (after reading the articles by Graves and Dykstra and Pearson) it is quite clear to me that Chall is just another example of someone misusing research. These studies never came up with any direct correlation between phonics instruction and improved reading. These studies do not really take into account any changes in demographics or populations. Even at the time the researchers were unable to completely, scientifically control all of the variables.

Data from Week Seven

During the seventh week of class, document review revealed that the instructions for reader response became more open to student interpretation. For example:

Please use "reader response" to process this article. These questions will help focus your response process.

A. What do I want to remember from this chapter that may be helpful to my present or future teaching?

B. How do these readings connect to my present or prior experience in education? What stories or examples can I recall that relate to the information in these chapters?

C. What questions or comments do I wish to discuss with my colleagues about the reading?

D. What would I like to have clarified, explained, and/or extended?

For the seventh week of online class, there were 12 original postings of the assignments and 12 different discussions occurring after reading two articles. There were a total of 134 responses from peers (this data does not include responses from the course instructor and class TA). There was an average of 11.2 responses for each original post of the articles read. While some of these were one-line questions, most involved participation and contributed additional information.

The responses showed that the students were involved in the reading and communicated with their peers. There were more responses the 7th week; this shows that more "conversation" is occurring online. Twenty two percent of the responses involved the students asking each other questions. Of these, 42% inquired into clarification, 21% asked for support, and 37% sought a solution. Students were asking more questions, but less were asking clarifying questions. Students seemed to get to know each other better, so less clarification was required. Students were beginning to need less technical or interpretive textual support from their peers, and started to ask for their help in solving their classroom dilemmas. In other words, they were beginning to apply some of the theory they were studying to the context of their classroom experiences. They were assimilating or accommodating (Piaget) this expository information into their existing schema. As a result, the scaffolding, which occurred from reader response in week seven, was scaffolding of a practical application nature.

Most of the comments, 77%, were statements. Most of these statements, 58%, were either agreeing or affirming statements made toward their fellow peers. This is an increase from Week 3 when 37% of the statements either agreed or affirmed. It appeared that students were appreciating their students more as they got to know them better. Also, 39% of the students provided suggestions or offered a solution.

For example LP wrote:

E: You asked how we respond to children who have the ability to read, but have no interest in doing so. I firmly believe that you should never FORCE a child to read for pleasure because then you are actually punishing a child with books. What I do is read aloud every day. Some days I read from a chapter book that we read throughout the year, some days I choose a trade book about something my kids like, like trains or birds, some days I read some funny poems and some days I read something by Jon Sciezka (sp?), who can motivate any boy in the world to pick up a book because of his funny almost inappropriate humor. What I have found is that even though the book has already been read to my students there is always a run on whatever book I have read aloud . . . they all want to read it again! Through the course of the year everybody finds some kind of book that they do like reading. I try to keep a large variety of books on my bookshelf, some easy, some difficult so that all students have something that holds their interest. Luckily Barnes and Noble gives teachers a 20% discount on books they buy for their classroom! LP

It appears that students feel more comfortable in offering their services and sharing information.

Discussions were enhanced by 45% of the responses, in which additional information or explanations were supplied to peers through the WebBoard. This is an increase from Week 3 of 19%. Thirteen percent of the students shared information in the form of a story, up from 5% in Week 3. Students seemed to feel more at ease and more able to share personal and relevant information. Students were beginning to open up and honestly share with their online peers. Also the stories were often of the students' actual experiences as a learner, or from her experiences in the classroom. This fits with the need to scaffold with practical application. The more open format of reader response gave students the opportunity to bring forward their personal experiences in response to the readings.

No corrections were made in Week 7, down from 3% in Week 3. It appeared that students appreciated and respected their peers more and felt they did not need correcting; students understood each other better.

While no students expressed empathy in Week 3, 2% of the responses did so in Week 7. Since students were beginning to know each other, they appeared to feel closer and express that relationship. No students expressed resistance or a negative reaction, compared to 3% in Week 3.

Fewer exclamations were found in Week 7 when compared to Week 3; 5% of all responses made in Week 7 were exclamations. All of these responses were positive, though. Forty two percent of all exclamations shared value or appreciation, 29% expressed excitement, and 29% expressed pleasure. Negative responses were absent from postings.

The following table 1.0 summarizes and compares the responses by category.

Number of postings		58	134
Number of students responding		16	24
Average Response per posting		3.6	11.2
		Week 3 % Response	Week 7 % Response
1.	Questions asked	17	22
a.	for clarification	50	42
b.	for support	32	21
c.	for a solution	18	37
2.	Statements made		77
a.	supposing or imagining		
b.	agreeing	23	58
c.	affirming	14	
d.	suggesting	13	39
e.	offering a solution	5	

f.	commiserating	5	
g.	presenting a problem	4	
h.	providing additional information (explaining)	26	45
i.	in the form of a story	5	13
i.	in the form of metaphor or analogy	1	
i.	correcting	3	0
j.	expressing an aha or a breakthrough	3	
k.	expressing empathy		2
l.	expressing value or appreciation		
m.	expressing resistance	3	0
n.	expressing a negative reaction		0
3.	Exclamations	8	5
a.	of excitement	50	29
b.	of pleasure		29
c.	of value or appreciation	25	42
d.	expressing resistance	12	0
e.	expressing strongly negative reaction	12	0
f.	of encouragement	12	

Table 1.0 Responses by Category.

Intermediate Conclusions and Implications

Using Rosenblatt's theory of reader response with the expository text used in two teacher certification courses, coupled with opportunities for social interaction which connected students thought and language in an online environment, I wanted to see:

1. If scaffolding of learning would occur as a natural outgrowth of this process
2. And if it did, what forms of learning support would it provide.

The work of Piaget and related theorists is based on the premise that when individuals cooperate on the environment, socio-cognitive conflict occurs that creates cognitive disequilibrium, which in turn stimulates perspective-taking ability and cognitive development. When students respond to text incorporating their own unique schema, through their statements, questions, and explanations and share this response in online discussion then knowledge can be social, constructed from cooperative efforts to learn, understand, and solve problems. Current cooperative learning theorists and practitioners David Johnson and Roger Johnson create cooperative learning environments based, in part, on positive interdependence. In this environment:

Positive interdependence exists when students perceive that they are linked with group mates in such a way that they cannot succeed unless their group mates do (and vice versa) and/or that they must coordinate their efforts with the efforts of their group mates to complete a task.

This environment does exist in this online learning community. At first, it was imposed by the guidelines of the assignment that required that students respond to each other's posting. This led to positive interdependence (Johnson and Johnson). Positive interdependence promotes a situation in which students can achieve promotive interaction. Promotive interaction occurs as individuals encourage and facilitate each other's efforts to reach the group's goals (such as maximizing each member's learning). Group members promote each other's success in part by (Johnson & Johnson, 1989):

1. Giving and receiving help and assistance (both task -related and personal).

2. Exchanging resources and information. Group members seek information and other resources from each other, comprehend information accurately and without bias, and make optimal use of the information provided. There are a number of beneficial results from (a) orally explaining, elaborating, and summarizing information and (b) teaching one's knowledge to others. Explaining and teaching increase the degree to which group members cognitively process and organize information, engage in higher-level reasoning, attain insights, and become personally committed to achieving. Listening critically to the explanations of groupmates provides the opportunity to utilize other's resources.

The authors believe that the positive interdependence that exists within the framework of cooperative learning is, in actuality, an explanation of the scaffolding which occurs within this online learning community as a result of students' reader response to expository text.

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Bridging Craft and Academic: A Demonstration of Web-Based, Problem Based Learning Training Materials

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Come and learn about a multi-media web based learning tool -- built on a constructivist (problem based learning) approach--designed for use in teacher development.

Objectives and Overview

The purpose of this proposed poster /technology session is to present and discuss interactive, web-based learning tools that are the end-product of CASELINK. During this session participants will (1) become familiar with problem-based learning and its uses in teacher development; (2) have the opportunity to explore one of the PBL web-based modules in action; and (3) gain an understanding of the power of using online environments to facilitate PBL.

CASELINK and its successor School Link are development projects whose impetus was a question: How can traditional academic knowledge and the highly specific and contextualized "knowledge-in-practice" be integrated in a meaningful context for use in professional training? Utilizing a problem-based learning pedagogy, the CASELINK team designed, developed and field-tested four interactive multimedia web modules for use in existing courses for the development of prospective teachers' understanding of special education. When "knowledge of practice" and "knowledge in practice" are linked together in professional development programs, due to the way in which traditional learning is structured, the gap between the two can ordinarily be wide. Traditional "knowledge-*of*-practice" is packaged and typically resides in textbooks and lectures in central locations because these formats permit a satisfactory balance of per trainee cost and overall instructional benefit (i.e., the knowledge obtained by each learner). On the other hand, supervised teaching in the field is distributed over a geographical area defined by cooperating institutions and without much control of the nature or content of experiences. Creative solutions to this problem are important in order to improve the overall quality of professional preparation. The CASELINK modules attempt to address this issue using problem-based learning pedagogy along with multi-media web technologies.

CASELINK has developed a new pedagogical strategy for allowing access to professional knowledge by using a case/problem based learning program supported by interactive, multi-media, website case studies and associated data and documents. The CASE materials that have been developed bring together information from school professionals (including regular and special educators, administrators, counselors and psychologists) in school site-oriented, co-operative teams as these professionals collaborate on real-life messy problems, in an attempt to capture knowledge-in-practice.

The use of hypertext and QuickTime video was chosen as the appropriate forum for presenting the CASELINK materials to student users subsequently all of the CASELINK materials are mounted in a systematic way on CDs and the web. These multimedia materials include photos and video segments of different children, their parents, peers, teachers and other school professionals, along with IEP's, and professional publications such as journal articles and book chapters.

Outline of the Session

During the session participants will have the opportunity to:

I. Interact with the a full PBL "CASE" that is designed for training teachers how to work with EL students.

Each Module can be viewed as having three main components: The problem framing component; the solution development component; and the reflective component.

A.. Frame the problem The process begins with a description of a core problem. Core problems will center around real school situations involving one or two disabled students. From the core problem, users will have several optional hypertext links to choose from, including links to role-specific individuals involved in the core problem. Examples of roles-specific individuals include parents, special education teacher, school psychologist, pupil, school administrator, general education teacher, etc.

Meeting. Groups of students then meet (either in real time of on line), in order to develop comfortable as well as efficient operating procedures (e.g., roles, responsibilities, notetaking/keeping). Student users then submit their understanding of the problem as a group, online through an interactive form on the module.

Stakeholders' perspectives. The submission of the interactive form then opens a gateway to a video presentation of the stakeholders' view of how they see the problem. Often these views are in conflict from each other as in a real life situation.

Reframing/reflection. Student users now are allowed an opportunity to reflect on differences between how they saw the problem and how the stakeholders saw it--with an opportunity to resubmit their problem statement if they so choose.

B. Constructing a solution to the problem

Role Strands. At this stage student users either choose or are assigned a *role.* Roles in most cases include parent, general education teacher, special education teacher, school psychologist, administrator, principal, and when appropriate the child with a disability. After determining which role they will adopt, the student researches all information within that stakeholders strand. This information can be obtained through video clips, reading assessments given, and accessing outside links on related topics on the world wide web.

Team Meeting. After obtaining all information they deem relevant to represent their role, student users bring their new knowledge to their team meeting at which point an agreement on a plan for the student in question must be reached.

C. Reflect on and discuss solutions. The final stage in the PBL module is the reflection and discussion regarding the submitted solution. In this stage student users are given a chance to compare their problem solution to that which was developed by the professional team in the case. As a team, the students sift, weigh, and integrate what information has been gathered. They discuss what differences exist between the professionals' solution and their own. They also reflect on the possibilities for these differences and the knowledge that they have gained from this unique process.

II: Explore some of the tools that are currently being developed to enhace the users experience with the CASE modules.

A. Chat rooms for team meeting and discussion
B. Video interviews with "experts" from the field.
C. Stand alone "information" modules that allow users to explore relevant topics in depth. (Such as IDEA, the Individuals with Disabilities Education Act).
D. Interactive pages that allow users to share (upload) resources and view and search through digital archives of previous solutions.
E.

Closing the gap between "knowledge in practice" and "knowledge of practice" requires education professionals - in-training to be brought as close to the reality of authentic school practice as possible. Knowledge-in-use is messy and is based upon the interactions of teams of school professionals; it exists in on-the-fly decisions in classrooms -- decisions that are grounded in years of experience; and it is always shaped by the context in which the specific problem-to-be-solved is situated. CASELINK attempts not to bring these aspects of knowledge to the traditional learning environment, but to use technology to recreate the learning space to more closely resemble an authentic school decision-making environment.

New Internet Tools for Facilitating Scientific Inquiry

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Abstract

This paper presents a case for using interactive Internet resources as tools for facilitating inquiry-based science instruction, as called for in the National Science Education Standards, with a focus on grades 4-14 application. Two categories of interactive inquiry sites will be demonstrated: (1) sites that provide simulation of scientific equipment and resources and (2) sites that allow students to interact with large educationally relevant databases.

Contrary to a common misconception, effective use of the Internet in science education has little or nothing to do with surfing the web. This is not to imply, however, that the Internet does not contain outstanding resources for supporting inquiry science. Experts are urging teachers to move away from activities that invite students to surf the web in favor of Internet activities that direct students to access and utilize pre-selected sites in order to accomplish pre-determined objectives (Huber & Harriett, 1998; Huber & Moore, 2001, Moore & Huber, 2001, Watson, 1999). For high school and middle school science teachers, interactive sites that use Java applets designed to facilitate students in accessing and interacting with large authentic data sets represent one of the currently most promising of Internet applications. This paper examines two such sites; one site permits active inquiry about principles of physics the other site supports inquiry learning about river ecology. In addition this paper will examine the use of these Internet resources for special needs students.

In evaluating the suitability of Internet resources for supporting inquiry-based instruction, it is necessary to first define what is meant by the term, "inquiry-based instruction." While no single universally agreed upon definition of inquiry-based learning exists, it is generally accepted that inquiry based classrooms are student centered and emphasize cooperative "hands-on and minds-on" learning activities in which problem solving and creative thinking are strongly emphasized. Through these experiences, curriculum goals are met as students construct meaningful, broadly applicable, well-structured, information-rich knowledge, skills, and affective domain attributes. The nature of inquiry-based instruction is perhaps most clearly described in the "vision" of the National Science Education Standards. As envisioned in the *Standards,* inquiry-based teachers function as facilitators and supporters of student learning rather than as disseminators of knowledge. The vision of the *Standards* is one of dynamic learning communities working within enriched learning environments supported by an educational system that has been overhauled to provide the support those communities will need. Within this setting, the *Standards* recognized the central and interactive roles of mathematics and technology in both scientific work and science instruction. According to the National Science Education Standards, in the inquiry-based classroom, students are actively engaged in cooperative, "hands-on and minds-on" learning activities that emphasize problem solving and creative thinking. Teaching problem solving and thinking skills to students with special needs, such as students with learning disabilities, mental disabilities, behavioral disorders and attention deficits, is also considered critical by many educators. Mildly handicapped students often are unsuccessful with tasks requiring inquiry and problem solving approaches (Mastropieri, Scruggs, & Butcher, 1997). However, when appropriately prompted to reason through new information, studies have indicated that students with special needs can understand better and comprehend more than when directly taught the same information (Scruggs, Mastrop ieri, & Sullivan, 1994; Sullivan, Mastropieri, & Scruggs, 1995). Scruggs & Mastropieri (1995) also reported that inquiry-oriented instructional practices could effectively promote the understanding of science concepts for students with mental disabilities. In their text, *the inclusive classroom: Strategies for effective instruction* (2000), Mastropieri and Scruggs note that;

> "Inquiry-oriented approaches to science and social studies, found in both textbook and activity approaches can also be adapted for students with special needs. These adaptations include use of hands-on materials, carefully structured questioning, redirecting attention, and reinforcing divergent, independent thinking." (p.545).

With instructional technology, in particular, multimedia applications, students with special needs can actively engage in scientific experiments requiring inquiry and problem solving and through appropriate prompting, more successfully reason through new information. "In addition to providing an opportunity to obtain and observe unique aspects of the content, these instructional delivery systems can motivate students and stimulate their curiosity" (Salend, 2001). Through these experiences, curriculum goals are met as students construct meaningful, broadly applicable, well-structured, information-rich knowledge, skills, and affective domain attributes.

While there is an abundance of Internet sites that disseminate useful content information, sites that support productive exploration of interesting academically valid questions, as discussed above, are more rare. However, some sites do make use of very effective computerized displays of quantitative information that do make data analysis more productive and intuitive. Among the most effective of these displays are animated interactive line and color gradient graphs, such as those incorporating within the River Run (http://www.uncwil.edu/riverrun/) and the physics activates found in explorescience.com. Importantly, students can, with a few points and clicks, change parameters defining the dynamic graphic displays. Thus, the utilities provide simple and engaging mediums for open exploration and powerful effective tools for hypothesis testing. As an example of a graph sequence that invites hypothesis testing, consider the graph shown in Figure 1.

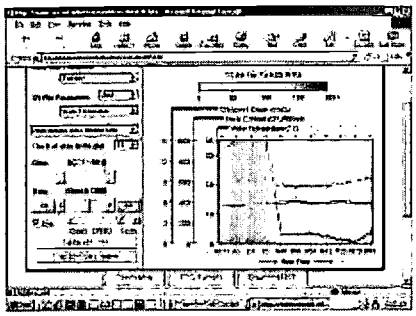

Figure 1. Data visualization from River Run Indicating highly turbid water with a high fecal coliform bacteria count at the upper sampling sites on March 9, 1998.

After developing a basic understanding of the cause-and-effect relationships underlying the displayed information, students could form hypotheses of how other variables might behave within this scenario and change system settings, and "run" animations to test their hypotheses. One of the strengths of the River Run Data Visualization Tool is that it provides numerous opportunities for students to discover and explore extremely interesting ecological events, which tend to stand out when the data is graphically displayed (Huber & Moore, 2001). These provocative anomalies are abundant because the river systems from which the data are drawn have experienced numerous highly noteworthy events during the years over which the data are collected. Specifically, the River Run resource provides data and utilities for exploring data on the water quality of the Cape Fear River and the Northeast Cape Fear River from 1995 to 2000. During these years these river systems experienced a major poultry farm spill, several ruptures of hog waste lagoons, five hurricanes, and a 500-year flood. Consequently, when water quality data on the rivers are explored using the data visualization tool, conspicuous spikes in line graphs and
flashes of color on the color mapper pop up frequently. These anomalies invite students to stop the animations, form hypotheses, reset parameters, and rerun the animations to test their hypotheses.
The explorescience.com web site facilitates inquiry by allowing a student to repeatedly conduct an experiment designed to illustrate important physical science concepts. For example in the density lab students can repeatedly conduct density experiments to reinforce the concept that density is the mass per unit of volume. This is a difficult concept for students to comprehend unless they can conduct the experiment repeatedly.

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Differential Characteristics of Students in On-Line vs. Traditional Courses

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On-line offerings of courses have increased exponentially (Hall, Watkins, & Ercal, 2000). Efforts to meet the needs of diverse, non-traditional students have created a market for instruction that can be delivered in flexible formats. While the movement to increase the use of on-line instruction is rapidly moving forward, there is a lack of empirical data to identify the effects of this technology (Maki, Maki, Patterson, & Whittaker, 2000; Shelton, 2000).

There is also a corresponding scarcity of research to identify the characteristics that might influence a student to enroll in on-line instruction over traditional instruction (Robyler, 1999; Wang & Newlin, 2000). Previous research on student characteristics has focused primarily on demographics of students participating in on-line courses. Robyler (1999) found no differences in age, gender, GPA, or experience with technology when comparing students who chose distance learning over traditional courses. Wany and Newlin (2000) found students' geographical location from campus, hours at work, and number of children at home were not related to course format choice. Gender, age, and employment status had no relation to students' perception of on-line courses (Jiang & Ting, 1998).

The highly unique features of on-line instruction (e.g., lack of physical presence of instructor, flexible timing, dependence on technology) suggest corresponding personality and attitude differences between students who elect to take on-line courses and student who choose traditional courses. Few studies have examined this possibility. Robyler (1999) found that community college students who enrolled in on-line courses valued control over pace and timing of learning in the course. Wang and Newlin (2000) found that students in a distance-learning course had a higher external locus of control than students participating in a conventional course. Field-dependent students are just as successful as field-independent students in taking an on-line course (Shih, Ingebritsen, Pleasants, Flickinger, & Brown, 1998.)

Research on the personal characteristics of students who enroll in on-line courses compared to students who enroll in live format courses is highly limited and far from definitive. This inquiry addresses this informational void by examining the personality, attitude, and demographic characteristics of students who enroll in on-line classes and students who enroll in live, traditional courses.

Method and Instruments

Participants were Master's degree students enrolled Summer and Fall semesters, 2001 at a medium-sized Southern university. Students registered for one or more of three core courses required for the M.Ed. degree. Each of the three courses had both an on-line and live section. On-line courses were completely on-line as the student and instructor never met physically. Course objectives and content were identical for on-line and live sections. Of the 76 students who registered for on-line courses, 51 (67%) agreed to participate in the study. Of the 80 students who registered for live sections, 69 (86%) agreed to participate in the study. Only two students who elected to take more than one course chose to take one course on-line and the other live. These students were classified as on-line students. Data were solicited the first week of each course. The sample (N= 120) was 78% female and the average age was 31.45.

Students voluntarily completed the Sixteen Personality Factor Questionnaire (16PF) Fifth Edition (Cattell, Cattell, & Cattell, 1993) and a brief demographic and attitude questionnaire constructed by the authors. The 16PF is a 185-item, widely used instrument designed to measure personality characteristics of normal functioning adults. The instrument has 16 primary scales (e.g., Warmth, Perfectionism, Privateness, Self-Reliance) and five global scales (i.e., Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control). Favorable validity and reliability evaluations are reported by McLellan (1995) and Watt (2000).

The author-designed questionnaire assessed student demographics and attitudes about on-line and traditional courses. Student demographics consisted of gender, age, number of graduate courses completed, employment, and number of miles residence was from campus. Students were also asked an open-ended question as to their reasons for enrolling in either an on-line course or a live course. Ten attitude items were measured on a 1-5 Likert-type scale, where 1 = strongly disagree, 3 = unsure, and 5 = strongly agree. Two-week test-retest reliability of the items averaged .65 and ranged from .51 to .79. Item numbers three ("I am very interested in learning the content of this course") and eight ("I think that the content of this course will be difficult") were excluded from the reliability analysis, as these items were not expected to remain stable, especially within the context of a five-week Summer course schedule.

Results

A multivariate analysis of variance (MANOVA) was conducted to test for 16PF scale score differences between student enrolled in on-line courses and students enrolled in live sections of courses. An overall, multivariate F (21,98)=

1.02, p = .45 was obtained, indicating no between-group 16PF differences. Thus, personality differences were not found between the two groups of students.

Means, standard deviations, and t-test results for the attitude items by group are reported in Table 1. It is apparent from Table 1 that several attitude items differed significantly by group. Students enrolled in on-line courses indicate a higher level of agreement (M = 3.50, SD = 1.01) than live format students (M = 2.39, SD = .84) on the equivalency of on-line instruction compared to traditional instruction. On-line students have a more positive view of on-line courses (M= 4.25, SD = .74) than live section students (M = 3.16, SD = .88. Students in on-line sections indicate that face-to-face interaction is not as necessary for them (M = 3.90, SD = .82) compared to students in live sections (M = 2.34, SD = .92). Finally, the meaningfulness of traditional, live instruction was rated considerably higher by students in live courses (M = 4.16, SD = .85) compared to on-line students (M = 2.70, SD = 1.02). No other attitude items differed significantly by group.

Between-group analysis of demographic items did not reveal any statistically significant differences. That is, students in on-line courses did not differ from students in live courses on gender, age, number of prior graduate courses completed, employment, or number of miles residence was from campus. Analysis of the open-ended question assessing reasons for selecting either an on-line course or a live course revealed that convenience was the reason cited most by on-line students and personal interaction was the reason cited most often by the live section students.

Discussion and Educational Importance of the Study

A result of this study is that the personality characteristics of students enrolling in on-line courses do not differ from students enrolling in live, traditional courses. The two groups of students did not differ on such 16PF scales as Independence, Openness to Change, Self-Control, Extraversion, and Self-Reliance. Higher scores on these particular scales would be congruent with the unique demands of the on-line instructional format. In mirroring the acceleration of on-line courses observed nationally (Hall, Watkins, & Ercal, 2000), this university has been offering on-line courses for three years. Thus, we may be at a point in time where on-line students are personally and demographically heterogeneous.

There were however, significant attitude differences between the two groups of students. Students in on-line courses perceived that format as more equivalent to traditional instruction and had more positive views of on-line instruction than students enrolled in live sections of courses. Also, the latter group indicated that traditional instruction is more meaningful to them and that personal interactions are important in their learning as compared to on-line students.

Essentially, on-line students' perceptions of on-line instruction were more positive than the perceptions of traditional students who viewed on-line instruction with ambivalence. This was true even though traditional students did not differ from on-line students in computer savvy and course expectations. It would seem prudent for institutions to be responsive to the ambivalent views of many students and not adopt a "one size fits all" mentality in planning instructional formats. This seems particularly advisable in postsecondary institutions in which a business model atmosphere could inappropriately define technology as a goal, not a means to an end (Katz, 2001).

A relevant observation in this study was that on-line students did not reside significantly farther away from campus than traditional students. Equally important was the finding that the majority of on-line students reported that the major reason for selecting the on-line format was convenience, not driving distance. These two findings refute the popular notion that on-line courses are a form of distance education and suggest that vigilance be used to avoid over-commitment to students' desire for convenience.

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The Learning to Teach with Technology Studio: Demonstration of a state-of-the-art Web-based Professional Development system for teaching K-12 technology integration

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Abstract

In this demonstration and follow-up discussion, participants will examine an existing online professional development system for preK-12 technology integration and explore key issues related to designing this type of a system. One such Web-based system, the Learning to Teach with Technology Studio, will be presented. Following a demonstration of the toollearning environment, presenters and participants will examine the following key issues: (1) designing learner guidance and assessment systems; (2) balancing educational theory and practice; (3) building long-term partnerships with teachers; and (4) supporting online peer collaboration and community.

Background

In recent years, Web based professional development has expanded rapidly throughout higher education, corporate training, and the preK-12 arena. Organizations and institutions are increasingly offering Web based professional development opportunities to preK-12 educators. "Increasingly, the Internet makes it possible for educators to choose from a tantalizing array of professional development offerings – at a time and location of their own choosing" (Mather, 2000).

In the past several years, there has been an increasing body of research that highlights how technology can help to improve teaching and learning. (Barab, Hay, & Duffy, 1998; find other references). This has caused increasing demands for technology integration in schools. Recent reports have indicated that eighty percent of teachers report they do not feel prepared to integrate technology with their teaching (National Center for Education Statistics, 1999). Since finding time and resources for professional development in technology integration can be challenging, web based instruction offers a convenient, accessible, and often inexpensive method for updating technological and pedagogical expertise. It also provides opportunities to build a long-term plan for development of technology integration skills in an educational environment that, unlike short-term workshops, provides ongoing learning, mentoring and networking opportunities.

Yet Web-based learning environments are new, and principles for the design of this environment are just emerging (Duffy, Dueber, and Hawley, 1999; Kirkley, in preparation). In particular, supporting practicing professionals in a "learning anytime, anywhere" environment can be quite challenging. Yet it is the design of these types of environments that hold unique opportunities for enabling preK-12 teachers to seek convenient but high quality professional development opportunities to help them meet personal and professional goals.

Examining Issues of Developing an Online Professional Development System

The Learning to Teach with Technology Studio (LTTS) is one example of a Web based professional development system offering quality instruction in preK-12 technology integration. Funded through a five-year grant from the Department of Education's Funding for Improvement in Post Secondary Education (FIPSE), the LTTS is being developed at Indiana University to provide high quality Web-based learning modules emphasizing preK-12 technology integration. Teachers can work towards gaining professional credit units, certification, or graduate credits through partner institutions. Using an e-commerce model, teachers pay for taking modules, and module developers receive royalties.

Modules are designed by exemplary teachers who have experience integrating technology into their own K-12 classrooms. All modules use an inquiry based learning approach. Students are first presented with scenario where a problem or project is posed, and then they produce a product, such as an instructional plan, to address the problem. Problems are ill-structured because there are many ways students may develop and present a solution. Modules are centered on meeting learners' needs, which is critical for an online professional development system for inservice teachers. The LTTS also has a set of personalized tools that support the learner in reaching his or her professional goals.

There are four main issues related to designing a high quality web-based professional development environment. The first issue is developing strategies to provide learners with just-in-time guidance and assessment feedback. Currently most of the instructional design for Web based learning environments uses the information transmission-based model of learning where instruction occurs through written lectures, papers, and online tests. Yet new types of distance learning environments are being called for that promote student engagement using inquiry and

problem solving (Institute for Higher Education, 1999). Inquiry based learning is one example of a learning methodology that creates opportunities for online collaboration and problem solving (Duffy et. al., 1999). Yet supporting learners in an inquiry based, learning anytime environment can be challenging and requires new methods of instruction, scaffolding, and guidance as well as tools to support them.

The second issue relates to how to balance educational theory and practice. From a situated learning theory perspective, the learner is enculturated into a community of practice (Brown, Collins, and Duguid, 1991) where cultural norms, values, communication, and knowledge are part of the interwoven process of learning. Skills, strategies, and learning processes are closely connected to their context of practice (Naidu and Oliver, 1996). Building on the notion of situated practice, LTTS offers educational experiences that help teachers examine issues and develop materials based on their own students, classroom, and teaching context. LTTS is using inquiry based learning to enable teachers to examine questions, problems, and issues from their own context and produce a final product they can use in their own classroom. Modules are designed to help teachers apply theory to their own teaching practices. Yet depending on the educational outcome, there is not always agreement to how to balance theory and practice. This is an important issue to address in order to make professional development meet the needs of learners as well as institutions granting credit.

The third issue deals with understanding how to build long term partnerships with preK-12 educators. For an online professional development system to be successful, there must be strong partnerships established with key preK-12 educational organizations. The challenge is not only in developing these linkages but designing a system that can be tailored to support those needs of these partners

The fourth and final issue is developing tools and strategies thatsupport online peer collaboration and online community. Peer interaction and collaboration has been found to have a valuable impact on learning. The joint application of the individual efforts of two or more persons to a learning-related task provides students with the opportunity develop critical thinking skills (Webb, 1989). Also, it can help students develop conceptual change and new understandings (Roschelle, 1992). Although we value collaborative learning, understanding how to support it in an online learning environment is critical to the success of any online learning system. The online learning community that LTTS will attempt to foster is influenced by the environment of instruction, peer and instructor interactions, and tools to support the learning process.

In conclusion, this demonstration will offer participants the opportunity to not only explore an innovative web-based professional development system but examine the key issues related to helping systems such as this one scale up to meet the needs of preK-12 educators as well as other audiences.

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European Computer Driving License Online Course for In-Service Teachers and Public Administrators

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Abstract: The European Computer Driving License (ECDL) is the European-wide qualification, which enables people to demonstrate their competence in computer skills. The UNESCO International Centre for Scientific Computing (ICSC) and the Czech Technical University specialists developed a first version of an ECDL Online Course in WebCT. This online course is used on a graduate level as well as for lifelong learning of teachers and public administrators.

Introduction

In the next years the Czech Republic is going to be affected by globalization and European regionalization. It will also be exposed to further global scientific and technological development of hardly predictable speed and intensity, which however indicates a number of significant surprises unprecedented in the past. The remarkably intensive internationalization will also affect the field of education. It is necessary to assume a realistic attitude to the future behavior of investors. The investors, big as well as small, expect to find in any country employees and managers who master the newest technologies and highest standards of ICT, who can run operations in branches and lead subordinates, manage the demands of new methods of work organization and who are able to communicate in an international and multi-ethnic environment.

Each of the generations will need a specific conception of lifelong learning with differentiated content, methods and approach. Such education must involve orientation towards long-term individual life planning and support active attitudes to individual employability. The Czech education system will have to change fundamentally to be fully comparable with the successful international systems, their formal aspects, but above all their content and methods.

Example of an ECDL Online Course

UNESCO International Centre for Scientific Computing (ICSC) at the Czech Technical University - Prague and the Czech Technical University specialists developed a first version of a European Computer Driving License (ECDL) Online Course. See http://www.cvut.cz/online, Demo - English version. The ECDL Online Course was developed in WebCT, which is a tool that facilitates the creation of sophisticated World Wide Web-based educational environments. For more information see http://www.webct.com/

ECDL is the European-wide qualification, which enables people to demonstrate their competence in computer skills. Key benefits for you as an individual are that it:

- raises your level of competency in IT & computer skills
- improves your productivity at home & work
- requires no prior knowledge of IT or computer skills
- provides you with an industry recognized qualification

Conclusions

The domestic and international indicators of lifelong learning show that especially our adult education develops too slowly and with poor results. Only one fourth of Czech businesses hold education and training to be the prior component of their personnel policy and the human resources development to be an integral part of their development strategy. Most sectors lack consistent education and training of the staff. The expenditures on education in Czech businesses and other organizations are less than half, compared to the same expenses in the Western European countries. Only every twentieth job applicant participates in retraining. Despite the increasing proportion of older generation in population, there has been no considerable development in their further education.

The above-mentioned reasons indicate an urgent need for a resolute turn. The following measures will be necessary:

- To specify the unclear responsibilities in various fields of adult education and to acknowledge lifelong learning as a key aspect of the national, regional, business and individual development.
- To establish support of lifelong learning using the experience of the successful countries.
- To motivate secondary schools, higher professional schools and universities to a larger use of their educational capacities for further education.
- To devise and implement accreditation mechanisms for educational programs and institutions.
- To encourage building of compatible and accessible databases listing providers of various lifelong learning forms and programs.

UNESCO International Centre for Scientific Computing (ICSC) at the Czech Technical University - Prague and the Czech Technical University specialists developed a first version of a European Computer Driving License (ECDL) Online Course. This online course is used on a graduate level as well as for lifelong learning of teachers and public administrators. See http://www.cvut.cz/online, Demo - English version, User Name "guest", Password "guest".

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Acknowledgements

This work was supported by a grant from the Czech Ministry of Education, Youth and Sports and by a team of specialist of the Czech Technical University in Prague, coordinated by Mr. Zdenek Maruna. Zdenek Maruna, Theodor Adla, Jan Jirovec and Marcela Dubnova created the ECDL Online Course in WebCT.

Diversified Instructional Modality System for Learning Transfer

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Abstract: Transfer of learning in online learning environment has become an emerging issue in colleges and universities as more institutions try to develop and deliver instructions online. In an effort to develop effective instructional development system to promote transfer of learning in online learning environment, the Department of Human Resource Development at the University of Tennessee has initiated a project called DIMS (Diversified Instructional Modality System) and developed online courses for undergraduate students. This paper will discuss the instructional design, technical, and development issues applied to the system for meaningful and transferable learning experience.

Introduction

Many researchers have conducted studies on instructional factors affecting student's learning, but seldom are found in instructional design factors affecting learning application. Attaining high degree of learning during and after a course is important, but students value such learning experiences that can be applicable and transferable to their personal situations and future careers. In order to satisfy students' needs for learning transfer, instructional designers of online instruction are required to identify appropriate instructional strategies and events that support students' learning and application of learning. The DIMS team was created in 1997 to develop an effective instructional development system to deliver undergraduate courses online. After the startup years to develop the system and four online courses, the DIMS team members recognized that the next step to upgrade the system was adopting instructional strategies increasing students' transfer of learning as well as learning itself. As a result of the speculation, a more diversified instructional modality system was developed and applied to create transferable online instruction.

Theoretical foundation

To identify learning transfer variables in organizations, many researchers studied instructional principles and strategies supporting learning transfer. Some example factors affecting learning transfer found include the principle of identical elements (Baldwin & Ford, 1988), the relevance of the content to the learners' jobs (Bates, et al. 1997), and the teaching of general rules and principles that underlie the instructional content (McGehee, 1961). As an instructional process to promote learning transfer, Gagne introduces nine events of instruction: gain attention, inform learner of objectives, recall prerequisite knowledge, present stimulus, provide learning guidance, elicit performance, provide feedback, assess performance, enhance retention and transfer. Evaluation was another factor to assess and improve instructional quality for better learning transfer through formative and summative evaluation. All these principles and guidelines were considered to develop a comprehensive course development system by the DIMS team.

Instructional Design and Technical Consideration

When the DIMS team was initiated, direct conversion from the classroom instruction to online format was utilized for course development. This method adopted presentation based delivery format (posting slide presentations on the web) because it helped develop online instructions from exiting classroom courses in a speedy and economic way. In 2000, the DIMS Wave II, which was the next generation of the development system, was created. In this system many advanced instructional design considerations and technologies were applied.

To make students' learning experiences meaningful and transferable four major learning principles were applied in the new system. First, self-directed active learning asked the learner to engage in learning content through web interaction. The learner, therefore, was mainly responsible for getting information and knowledge for specific subject area. Instructor guided the learners with carefully planned interventions

whenever they are needed and considered to be appropriate to enhance students' learning experiences. Second, networked collaborative learning was adopted to promote learners' direct and/or indirect involvement in group activities to augment their learning. Third, to make the networked learning experience successful, the learners were asked to contribute shared knowledge building by active interaction with other peer learners through question/answer sessions, group discussions, and other team based reflective learning processes conducted online. The cyclical knowledge building processes made by all students in each semester eventually have turned into a master course knowledge database that was utilized by learners, instructors, and tutors to enhance instruction later. Finally, to ensure mastery and transfer of core competencies required by each course, learners were asked to develop a plan to apply learning to their works, current studies, and daily lives at the early stage of the semester. The application plan was then evaluated and modified throughout the semester for maximum transfer of learning to occur. By applying these learning principles, the following learning framework was developed.

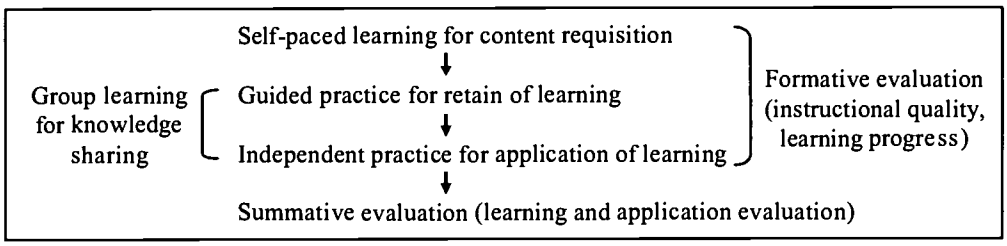

Figure 1: Learning framework for DIMS

To effectively manage course development and delivery diverse web technologies were utilized. First, Java-based quiz generator was used to develop online tests and quizzes. CGI scripting enabled the use of forms for interactive activities and discussion sessions. Class assignments were also submitted through web forms using the CGI scripts. A database enabled interface system was adopted to present content of group case study and elicit group decision making through group communication and consensus. Streaming and multimedia plug-ins were required to view diverse multimedia learning contents developed for online delivery.

Outcomes and Future Needs

As a result of applying valid instructional principles and evaluation standards, the students learning experiences could have been increased to a successful degree. For example, the overall learning increase resulted from the new system was significant when it was measured and compared between the beginning and end of a course. Evidences of a high degree of learning application made by the students during the learning were also found. Many students commented their learning experiences were enhanced due to the interactive and supportive features of the delivery system.

As a future need enhance the system and quality of online instruction, the DIMS team is planning to embed a reflective mentoring system in the online instruction delivery. The major benefits of the system include stimulating the processes of analysis, synthesis and evaluation of learning content into students' learning experiences through reflective thinking and mentoring processes. Another issue is improving instructor quality for online instruction. Since those competencies required to teach online classes are different from classroom instruction, instructor development through training sessions is necessary.

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The Question of Quality: Evaluating the Effectiveness of Distance Education

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Determining the effectiveness of distance-delivered courses and programs is important not only from an instructor's perspective, but a necessary function for many stakeholders involved in the support of distance education (DE) efforts. This session will address the various aspects of DE that should be assessed in order to ensure a comprehensive evaluation strategy for distributed learning experiences.

Problem Statement
The outcomes of distance education initiatives can provide valuable insights to program effectiveness, as well as justification for program continuance. Unfortunately, the questions that are often asked about DE are either too few or inaccurately focused. For example, one of the common inquiries about distance learning is how it compares to face-to-face instruction. Although prevalent, this question is a poor one, as it is based on the premise that the delivery medium is the only factor that affects learning. The fie ld of instructional technology discourages the use of such "media comparison studies" and offers a variety of solutions for determining the instructional efficacy of DE events.

Besides the effectiveness of the instruction, many other factors contribute to the success (or failure) of distributed learning initiatives. Student support services, technology functionality and accessibility, and participant completion rates are all indicators of the quality of a distance course or program. Cost effectiveness is yet another factor that draws great attention in terms of program justification and continuance. Some institutions expend tremendous monetary resources to create technological infrastructure and student support systems, and as such, must determine if the resources invested produced the desired outcomes. As anyone involved in the implementation of DE is well aware, the complexity of DE systems can make the assessment of such efforts quite challenging.

Description of solution
All of the aforementioned issues can be addressed by a comprehensive evaluation program. Such an assessment will require the involvement of various stakeholders in the DE delivery process. This presentation will offer strategies to create a thorough and informative approach to answering the question of quality for distributed learning experiences. Recommendations will be made regarding effective questions and techniques for distance education initiatives so that attendees can implement such solutions at their own institution.

Outcome
This presentation will be conducted by a group of faculty who have both subject knowledge of evaluation design, as well as three years of experience in the delivery of an on-line Master's program in Instructional Technology. The presenters will draw from their experiences in determining their own program's effectiveness and translate that to a set of generalized evaluation practices. Having to analyze the program that they offer has been informative in terms of defining what is meant by program "success" and what factors affect successful outcomes.

Relevance to other institutions
This session will be of interest to many conference attendees, who are likely stakeholders in the success of distance education programs at their own institution. Being able to demonstrate that the heavy resource requirements of distributed learning environments produce effective returns and meet the goals of the institution will likely attract a variety of participants across the spectrum of SITE attendees.

Accessibility for Distance Education

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Abstract: As cutting-edge technology enable universities to offer distance education courses to a diverse population, it becomes increasingly important that efforts are made to help students break potential technology barriers to learning. One of these potential barriers is the issue of accessibility, referring to the degree to which a person with a disability can access technology. Students taking distance education courses are required to interact with technology, often engaging in sophisticated use of technology. This also extends to research they might be required to do at a distance, once again requiring the use of technology. For students with disabilities, it is important that instructors and instructional designers consider their special needs and try to adapt the technology in their course so the students will not be at a disadvantage. This project involves the development of a web site to help instructors evaluate the accessibility of their courses and make necessary changes to increase accessibility.

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Preparing Teachers for Active Online Learning Environments

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Building a Vision

At Chinook College, we work with both classroom teachers and online teachers, preparing them to create meaningful and interesting online activities and programs for their students. The establishment of an effective professional development path is critical in creating a climate of confidence in which teachers feel supported and competent for the task. Our *right on time* professional support gives teachers the courage to be innovative, implementing new technologies in their work with students.

As educators create active online learning experiences, best practices from traditional face-to-face interaction must be adapted to the virtual setting. But more than this, students must be enabled to interact with content and community in different ways. Emerging technology tools invite us, demand of us, to consider new strategies for working with our learners.

Online teaching requires a significant cultural shift on the part of teachers and curriculum designers in order to optimize the interactive and collaborative potential of networked activities. (Kearsley, 2000). It may, in fact, require a lengthy process in terms of changing well-developed teaching methods. Teachers often have to adapt to a world unfamiliar to them yet very familiar to their students. Helping educators to make this shift will be a critical factor in the effectiveness of any virtual learning program. Staff development for teachers must prepare them for a role of both coach and resource facilitator whereby they nurture active learners toward participation in their own learning processes. (Kearsley & Lynch, 1994)

Who creates the staff development opportunities when the environment is so young, compared to traditional classrooms? How does a rapidly evolving technological system allow for effective vision-building and skill development? Philip Schlechty (1997) uses the term *trailblazers* to describe those who take the first steps in systemic change. These paradigm-breakers are the very few who have strong enough beliefs in themselves to pursue their novel ideas, in the face of a lack of belief displayed by the current system.

While there may be a number of trailblazers in a large institution, there is an art to finding and empowering them. The desired systemic change calls for at least a minimum of support and recognition along with the freedom to make and learn from mistakes. Gathering and mentoring those with a love for learning and a pioneer spirit must be done in a manner that is sustainable and purpose-driven. Our experience is that the desired outcome is best realized through a planned staff development initiative. Teachers require a timely support environment in addition to entry points commensurate with their skill level. This is in contrast to *drive-by staff development* (Senge, 2000) where training is viewed as a one-shot event, disconnected from the essential work of schooling.

In Chinook College's professional development program, educators start at a common point, and then choose their route based on the context of their teaching. Classroom teachers are given support as they create activities designed to enhance the learning experience of their students. Teachers who facilitate courses in our online program are mentored in a different way through participation in a virtual hub, a source of ideas, information, intervention, solutions, tutorial help and modeling. The themes of designing and facilitating online learning are explored in our PD courses, all of which are offered online, within a framework of understandings validated by the most current research. These themes will be developed in the remainder of this paper and illustrated through sample activities from our professional development courses.

Illustrating Themes of Online Learning

Participants in Chinook College's PD courses become online students for several weeks in courses facilitated by one or more trained instructors. By identifying strategies for building an online learning community, teacher-students come to see the range of learning options that support interaction, collaboration, and social presence.

Creating a Community of Inquiry

When teaching and learning migrate from the classroom to cyberspace, there are significant changes in the way that learners interact with the instructor and with each other. Palloff and Pratt (1999) make a case for a new paradigm of education arising out of cyberspace communities. "Key to the learning process are the interactions among students themselves, the interactions between faculty and students, and the collaboration in learning that results from these interactions" (p. 5).

Social interaction in a virtual learning environment has the potential to create a "community of inquiry" in which socially shared cognition takes place and critical thinking skills are practiced (Garrison, Anderson & Archer, 2000). A community of inquiry allows for the critical analysis of subject matter, questioning, and the challenging of assumptions. Such a community consists of three interacting components: cognitive presence, social presence and teacher presence. Cognitive presence describes the relative ability of the learner to construct meaning through sustained communication. Social presence is an emotionally and intellectually attractive telepresence, the degree to which a learner is perceived as a *real person* in the online learning community. Teacher presence includes both the design and management of the learning sequences, the provision of subject matter expertise, and the facilitation of active learning.

In our professional development courses, a variety of threaded discussions allow teachers to engage one another in meaningful inquiry. Following is a sample exchange over the issue of "cheating" in the online environment. The purpose of the activity is to allow teachers to experience an asynchronous discussion and determine in their own minds *the value this form of critical discourse might bring to their work with students*. The topic chosen is one that invariably brings out strong feelings from educators and results in some interesting exchanges.

Message no. 1367: posted by Course Facilitator on Fri Nov 30, 2001 23:39
A major concern about online learning revolves around the authenticity of student work. What responses would you provide if you were asked "How do we know that the student we are communicating with online really did the work?"

Message no. 1376: [Branch from no. 1367] posted by Ellie on Sat Dec 1, 2001 11:18
I think that over a variety of assignments including the discussion forums, chat and writing assignments, the student's "voice" emerges. Inconsistencies would certainly show. Bottom line, even with passwords, user names and established processes, the element of trust and the importance of knowing the student are critical. I guess that the same question could be asked about the completion of courses for students who meet face to face- and many of the answers would be the same.
Ellie

Message no. 1400: [Branch from no. 1376] posted by Loretta on Sun Dec 2, 2001 13:38
I think that after spending time with the student, and getting to know their level of commitment to completing their course, you develop a "sense" of that student, their comfort level and abilities. Hence, you would know their work and be able to recognize any discrepancies.
Loretta

Message no. 1417: [Branch from no. 1400] posted by Sylvie on Sun May 13, 2001 18:35
I agree with Ellie's first statement however, another question emerges. What if a friend or a parent has been doing the course work (chats, discussions, quizzes...) from the beginning. It would be very difficult to distinguish the students "voice". I believe that trusting the students is very important, but establishing a social presence among the students of the online class is just as important as the students' abilities.
Sylvie

Figure 1: Transcript of Asynchronous Discussion

The postings by teachers in Figure 1 illustrate how conferencing contributed to the growth of a community of inquiry in an introductory online PD course. Garrison, Anderson and Archer (2001) have concluded from their research that computer conferencing lends itself well to critical, practical inquiry. A computer conference will serve as a true

educational environment if it moves beyond "undirected, unreflective, random exchanges and dumps of opinion." (p. 21). Accordingly, our conferences are directed, focused and mediated if necessary by the facilitator.

Promoting Collaborative Learning

Far too much current training is aimed at short-term knowledge or skills acquisition—dealing with immediate needs (Drucker, 1995). "Learning how to learn" and project-based collaborative learning skills are rarely part of this training, yet these are the kinds of skills that employers say they want and that a knowledge-based economy demands. If individuals do not want to be left behind in the "turbulent, white water systems" of the new economy, they will require constant learning of new information and new skills (Vaill, 1996).

Many educators have discovered the role that technology can play in building collaborative learning group environments (Harasim et al, 1997). One of our professional development activities gives teachers the opportunity to experience the challenges and rewards of collaborating with colleagues electronically. The assignment requires group members to allocate responsibilities, choose a group leader and establish benchmarks for work completion. Each group is allocated a private discussion forum for planning and web space within the course, to which they post their final project as a presentation to the class. Following is a screen capture of one page from one presentation:

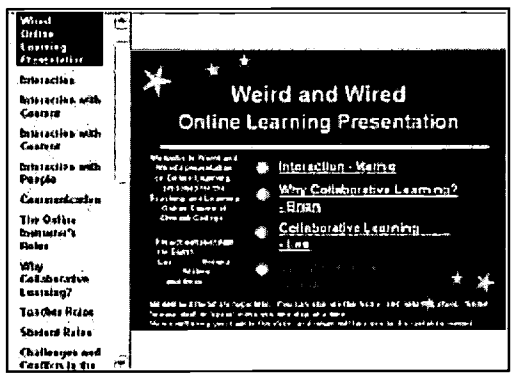

Fig. 2 Slide from a group presentation on successful online learning

As we prepare our learners to be knowledge workers, a major focus must be on their ability to work with others in completing a project. Teacher-students not only extend this critical competency to the online world, but are also invited to reflect on their experience, frustrations and all.

Offering Interactivity and Visualization

What is interactivity in the context of an online course? Gilbert and Moore (1998) focus on the reciprocal exchange between the technology and the learner. Using this definition, one might conclude that any assignment is interactive if it involves human or computer-generated response to learner input. Gilbert and Moore do take the argument further, though, citing the factor of "influence" as critical. Interaction, or interactivity (they use the terms interchangeably), occurs when there is an interplay and exchange in which learners are influenced by technology, groups or other individuals.

While the first level of Chinook's PD courses focus on facilitating student learning, the second level provides opportunities for in-depth examination of designing for active online learning. A question we always ask is "what difference would it make if we printed the course and handed it to the student to complete offline?". This speaks to the issue of optimizing the incredible potential of the Internet for interaction and visualization. The fact that our K-12 students are described as the *Net Generation* creates a whole new pressure and impetus to be creative in our use of technology (Tapscott, 1998). These young people engage with information sources on the net, as well as with other people, then construct higher-level structures and mental images.

One activity in our eDesign course requires teacher-students to collaboratively create a learning activity that will require learner interaction with a micrometer, a device used to measure small objects. An interactive java applet is embedded in a page of the PD course, as it would be in a mathematics course. Teachers are put in virtual groups and

asked to dialogue with each other and come up with an activity that would guide students in their manipulation and exploration of the micrometer. The groups then post their activity for others in the class to critique.

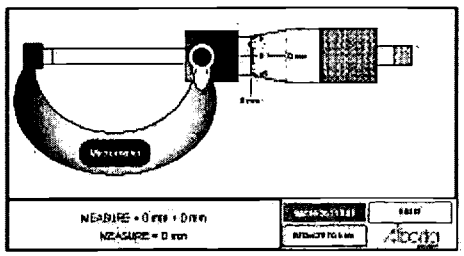

Fig. 3 Screen capture of interactive Micrometer Applet

One of the ideas generated involves: 1) holding up a few different objects (such as coins) to the monitor, then measuring by manipulating the java applet; 2) changing the resolution of the monitor and measuring each object again; 3) finding the ratio of the two measurements for each object and looking for a constant. The process involves both individual and group construction of knowledge, though no physical measuring device is ever utilized. Similar activities are included to address outcomes of other curricular areas.

Providing for Active Assessment

Teachers are designers as well as teaching and learning experts. We design learning experiences to lead our students to the achievement of learning outcomes. We modify those learning experiences so that we can be sure that all our learners understand. In addition, we design assessments that enable us to determine whether students have achieved those outcomes.

In creating an activity that integrates ICT (Information and Communication Technology) into curriculum, thoughtful planning is crucial. There are a variety of instructional design models that can help us in planning learning experiences. e-Valuator, a Professional Development course on assessment, invites teachers to design an assessment based on a model called "backward design", described more fully by McTighe and Wiggins in their book, *Understanding by Design* (1998). There are three stages in the process of backward design: identify desired results, determine acceptable evidence, then plan teaching and learning experiences.

The course helps teachers to examine the many issues related to effectively assessing students in online programs and activities. Additionally, they are provided with training in using the assessment tools available in the course management software. One of the directed activities in this course requires the teacher-learners to write a one-page proposal for an ICT activity they would like to design, using the backward design model. In doing so, they must come up with an "essential question" around which the activity is based and decide what will be accepted as evidence that the student has achieved curriculum and ICT outcomes. In other words, how will learning be assessed? Finally, they must write a rationale for the activity, describing where they would use it in their course.

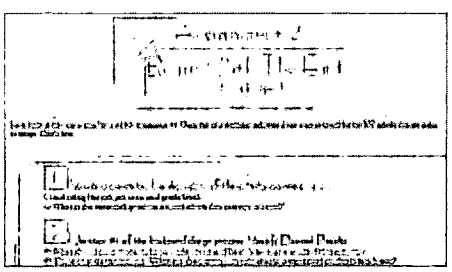

Fig. 4 ICT Assignment Introduction

Conclusion

Four themes of active learning have been discussed and illustrated in this paper. Several other themes must also be addressed by training initiatives for online educators. Some of these include reflection and feedback, thought-provoking entry points, clear outcomes and criteria for success, choice in process and product, focus on real-world applications and fostering emotional intelligence.

An exploration of changing instructor roles must accompany the hands-on investigation of each theme. Through semi-structured interviews of 20 university professors, Coppola, Hiltz and Rotter (2001) determined that instructors experience role changes in three domains as they move into e-learning environments: cognitive, affective, and managerial. Both online instructors and teachers who choose to include a distributed learning component in their classroom work must recognize and prepare for this crucial transformation.

No medium, in and of itself, will likely improve learning in a significant way when it is used to deliver instruction (Owston, 1997). The important professional development will focus on curriculum opportunities and teaching strategies that will improve learning by bringing the power of new technologies into the daily life of the classroom, virtual or face-to-face (McKenzie, 2000).

Abstract: This paper describes a professional development path designed to support teachers as they shift from the traditional teaching environment to one that incorporates a virtual component. Several key themes of designing and facilitating online learning activities are discussed, in the context of preparing teachers to take on these roles. Each theme will be illustrated through sample activities from online PD courses and will also be discussed within a framework of understandings validated by current research.

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Remote Assessment Methods for Deaf and Hard-of-Hearing, On-Line Learners

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Abstract: One challenge with online, remote teaching is properly evaluating the learner's knowledge in a fair, secure and efficient manner. Many teachers are apprehensive about online testing for a variety of reasons. One cannot touch upon the issue of remote assessment without also getting into the issue of ethics on the part of the student audience.

When implementing a testing method, factors such as security, ease and timeliness for data collection, ease of use by the students, turn around time and feedback to the students, flexibility of how the testing is done and administration/implementation are but a few of the issues that one should consider when implementing remote testing, whether the audience be deaf, hard-of-hearing, or hearing.

Introduction

Asynchronous, remote, online learning (also referred to as distance learning, e-learning, virtual learning, etc.) has evolved over the past 20 years in secondary education and is now rapidly growing. Much of this growth is due to increased Internet access speeds and new demographics of remote students who are enrolling in these types of courses. This same evolution is also occurring with the deaf and hard-of-hearing population. RIT, one of the largest providers of online learning classes in the U.S., enrolls 30 to 50 deaf and hard-of-hearing students each quarter into their online courses.

The growth of this online type of instruction brings with it a host of other issues, among them being the assessment of the learner's knowledge and the ethical practices of students taking these assessments. Although online assessment is available, traditional on-campus teachers do not readily embrace it like online learning teachers do for a variety of reasons. There are various commonly shared concerns by faculty using remote assessment methods. Some of these issues are covered in this paper, along with three proven methods of remote assessment used at RIT.

The Study

The findings reported in this paper were based on assessments used during RIT academic quarters and on surveys given to students at the end of the quarter in actual classes taught by either the author or by other RIT faculty. Data includes feedback from traditional, on-campus as well as distance learning deaf, hard-of-hearing and hearing students. Opinions, experiences and statements from various RIT faculty and distance learning technical administrators are also considered in the findings described in this paper. These assessment methods were used to not only evaluate the students' knowledge in the traditional or virtual classroom, but also to conduct preliminary research in an attempt to enhance distance learning specifically for the deaf and hard-of-hearing population. The "findings" are thus tentative and provide suggestions for more formal research in this area.

Three assessment methods used at RIT/NTID are remote proctoring, web-based testing through multiple choice and fill in questions, and downloading and uploading answers using electronic conferencing software.

1. Remote Proctoring Testing Method

With this method, a remote proctor, (usually the student's supervisor, manager of an office area, library or other establishment) administers the exam and then collects it and submits this to the online learning office via FAX or US Mail. The exam is usually a traditional paper format where the student fills in the appropriate answers. The tests can be open book or closed book, and a time limit can be established if appropriate. Upon receiving the test from the instructor, the online learning office then forwards the test to the proctor. The proctor has signed a contract with the online learning office agreeing to certain terms. This testing method provides as much flexibility as the traditional paper tests handed out in a traditional class.

2. Web-Based Testing Through Multiple Choice and Fill in Questions

This is the method the author prefers to use after six years of delivering online instruction to deaf, hard-of-hearing and hearing students and experimenting with the three methods described in this paper. In this online testing method, the instructor develops a number of questions, usually in a multiple-choice type of format, and posts this on a virtual system or web site with protected access. The students login to the site with their own unique username and password and take the test. The student has to select the correct answer from a list of potential solutions.

There is a way to also incorporate essay types of questions into these tests with systems such as Ideatools™ if this feature is needed. Ideatools is a turnkey, Web-based course development system developed by Simon Ting, an instructional developer at NTID. Ideatools is currently a local application that has some unique features lacking in commercial products. The trademark for Ideatools is currently pending. For more information about this system, contact Simon at his email address: SKTNMP@rit.edu.

When the student finishes answering all of the questions to his/her satisfaction, he/she then presses the *submit* button and the test is automatically posted in the administrator section of the site and the multiple-choice questions are automatically graded. Open-ended questions need to be graded individually by the instructor by accessing each student's test individually.

This Web-Based testing could also be combined with a lab assistant or other proctor to add another layer of security if the teacher felt it was needed as described in method 1 above.

3. Downloading and Uploading Answers Using Electronic Conferencing Software

In this method, a test *template* is developed using a common software format such as Microsoft Word. This template is designed so that the students can download the test from a folder in the electronic conference, type the answers to the questions directly into the template and then upload the exam to the secure conference drop box during the allotted time period. FirstClass™ conferencing software was used by the author and a number of his RIT colleagues to evaluate this method of assessment.

Findings

The most prevalent teacher concerns with any remote type of assessment seem to be: the integrity issue of whether a student is actually taking the test himself/herself and is not getting help or is not really someone else; the teacher's discomfort with the technology; conceptual limitations of the assessment; ease of use of the technology by students; how easy and how timely data collection will be; how difficult administering the testing will be. These issues will be discussed as they relate to each type of remote testing method below.

1. Remote Proctoring Testing Method

Remote proctoring seems to be the most secure of the three methods and allows the maximum flexibility for asking questions in a format that does not limit the teacher in a conceptual way. Instructors can design the tests in the manner they have been accustomed to with no limitations. The only thing to keep in mind is that students cannot ask for clarifications. Mistakes in the test cannot readily be clarified for the students, so tests should be as clear and as error free as possible.

One pitfall of this type of assessment could be the lack of integrity of a proctor, which from the author's experience is rarely an issue. Normally a professional person with visibility and accountability within a company or a public service sector normally sings the proctor contract and actually proctor's the test. Another downside could be if remote students knew each other, took the test at different times and clued each other in on the content of the test. This could happen since this testing is asynchronous (students take it at their convenience as arranged by the proctor). Several years experience with thousands of students and faculty at RIT has shown that these issues are rarely a problem.

Another pitfall from an instructor/student perspective is turnaround time. There is usually at least a one-week window between the time the instructor submits the test to the online learning office for dissemination to the time it is graded and returned to the student. Tests seem to trickle into the instructor's traditional paper mailbox using this method. Grading has to be done manually one test as a time similar to traditional classroom exams. This slow turnaround time is often annoying to the remote student who is anxious for prompt feedback.

2. Web-Based Testing Through Multiple Choice and Fill in Question Method

This is the most time efficient way of distributing, grading and providing feedback to the students, but it is also the most limiting conceptually. Most of the work for this kind of testing is done up front developing the exam to fit the online format. An exam has to be designed in a format that fits properly on the computer monitor when viewed through a web browser. The author chose NTID's IDEA Tools designed by NTID developer Simon Ting to implement this, although there are many other products on the market that would work fine for this task.

Multiple-choice types of questions are ideal for this type of system. There are also ways to incorporate fill-in types of essay questions, but they are much harder to grade and immediate student feedback for fill-in questions is not possible due to the way in which these are graded and the automated nature of reporting the results. There are usually automatic grading instruments that will provide timely feedback to a student on how they did as soon as they complete the test or at a time designated by the instructor. Different weighting of questions is often difficult to achieve with these systems, so it is easiest to design an exam where each question is worth the same number of points.

Students enjoy the prompt feedback from this kind of assessment system, but this feedback may not incorporate a curve or a slight change that the instructor may have added after the test was posted. Again it is advisable to have the test as error free as possible once it is posted.

Another logistical item to pay attention to is that spacing sometimes changes once it is viewed on the web through a browser. The instructor could design a perfect, error free test in Microsoft Word, but once it is posted on the Web and viewed from a browser, it may look slightly different. The author has experienced several situations where one space or a shifted character could determine whether the output to a computer programming question is correct or incorrect, and this has become an issue.

Each question must also be limited in size so that the sample code and the output choices all fit on the monitor screen. If there are several multiple-choice answers for a particular section of programming code for example, the students need to be able to see the original code for each answer that is provided. If the questions were not designed correctly, the user would have to scroll up and down to view the entire question and all of the corresponding answers.

The online method is a great way to test students who are not able to take advantage of the proctor system, such as technicians who are out in the field, people who work swing shifts, or independent consultants who travel frequently or are stuck in remote geographical areas. It is also a great way to combine and compare the results of on-campus students to remote students. During one quarter, the author was able to test traditional, on-campus, college aged deaf students along with a group of 15 hearing Pittsburgh Telephone company technicians using the same online testing method and compare their results. The deaf students took the test in their department's lab while being proctored by a lab assistant and the remote students took the test independently on their own. The results of the two groups were similar.

3. Downloading and Uploading Answers Using Electronic Conferencing Software

This method is fairly secure for remote testing, because the electronic conference can detect which student downloaded the test, at exactly what time the test was downloaded and what time the test was submitted back to the conference. Tests uploaded to a drop box are very secure, because only the teacher can read each of the tests. The advantage to the student is that they can view their submission details to assure that the test was received by the instructor and see the time and date at which it was received as well as when the teacher viewed and downloaded their test to grade it. FirstClass™ was used for the electronic conference of choice for the author's study.

Teacher Opinions and Issues with All Types of Remote Assessment

Whether talking to a teacher or doing a literature search, the issue of audience integrity frequently arises when the topic of remote assessment comes up. For this reason, many online teachers also choose to include authentic assessments such as student projects, group projects, term papers, portfolios of student work, and so on to determine the overall grade of a student for a given course.

One NTID faculty member, Dr. Greg Emerton, summarized what the author has found to be typical faculty concerns using online testing in a traditional classroom. Greg opted not to use computer testing for some of the following reasons: "I do my exams in class to maximize control of the testing situation." G. R. Emerton (personal communication, May 22nd, 2001) This security issue is probably the most prominent concern in online testing when talking to most teachers. Another faculty member, Dr. Marc Marschark, states his opinion of online testing. "I was concerned that if I had students answer essay questions online, they might be getting assistance (my tests are 'open book' -- not 'open friend'). Of course, that's no different than would be the case for take-home exams...but I never use those." M. E. Marschark (personal communication, May 22nd, 2001) Emerton also was concerned about the conceptual limitations of online testing. "My exams typically consist of a mixture of true/false and multiple choice questions and a number of short answer essays will allow the individual student to express what he or she knows about the topic. Reading across all of the answers for a given question also gives me a better sense of how the class is responding than scoring individual tests." This particular concern could easily be addressed by any one of the three remote assessment models previously described.

The responses of professors Emerton and Marschark are not uncommon. They are both master teachers and have many years experience teaching deaf and hard-of-hearing students at the post-secondary level. Their mindset is common among secondary and post-secondary instructors that the author has had a chance to interview.

Authors Findings on Remote Student Testing Integrity

The author has periodically allowed selected groups of on-campus students to take online tests both remotely on their own as well as in a controlled lab environment with a proctor present in his C++ and Visual Basic (VB) programming courses. Overall there was virtually no difference in the selected students' test scores, whether they take the test in a class or remotely on their own. Plenty of students have done poorly in their remote testing, when they could have easily booted up their computer and copied and pasted the program into a VB or C++ compiler to get the correct answers.

Distance Learning (DL) students' responses on remote tests also indicate that they did not cheat, as they could have easily uncovered the answers using the same computer that they were using to take the test. As a whole, DL students tend to do better, but according to the author's survey findings, this was because of the students' age and work ethic rather than due to the fact that they are using remote testing.

Authors Findings from Student Surveys

For the past two years, the author has collected data from deaf and hard-of-hearing students who participated in both on-campus and DL classes in an effort to better understand the advantages and disadvantages of the DL format and delivery and assessment methods for deaf learners. There is very little data or information currently available about deaf, online learners themselves and how useful online assessment is to their overall learning. The presence of the National Technical Institute for the Deaf (NTID) on Rochester Institute of Technology's (RIT) campus with 30 - 50 deaf and hard-of-hearing students

enrolled in Distance Learning (DL) courses each quarter provides an opportunity for examining these DL learners.

Because of the author's interest in the topic and the lack of information available, two questionnaires, with overlapping items, were developed to obtain deaf students' perceptions of the DL experience and to gather data on the work ethic and other characteristics of these students. (Mallory & Long, 2001). One questionnaire was general to all RIT DL students (of which 20 out of 33 responded) and a second was specific to computer programming courses taught in the Applied Computer Technology Department on campus (of which 19 out of 26 responded). This paper focuses on the work ethic and assessment parts of these questionnaires for the fall, 2001 quarter. This questionnaire consisted of 35 items, (12 demographic, 6 open ended, and 17 Likert items) which asked students to rate the importance of various instructional components for their overall learning. Students were asked to rate course components on a five-point scale from "not important at all" to "very important". They were also asked demographic and other types of questions, such as how old they were, what their communication preferences were and how many hours per week they spent working on this course. (Mallory & Long, 2001)

Within the ACT department, DL students put substantially more time each week into course preparation. For the ACT programming courses, 100% of the DL students put in at least 11-15 hours per week or more into the course each week, with 33% putting in 11-15 hours, 33% putting in 16-20 hours and 33% putting in 21 hours or more each week into course preparation. Their on-campus peers did not even come close to the same work ethic, with 35% putting in 1- 4 hours, 59% putting in 5-10 hours, 6% putting in 11-15 hours and nobody putting in 16 hours or more per week.

Conclusions

Online assessment has become the model of choice for most remote teaching faculty at RIT and elsewhere throughout the country. This method of assessment is slowly gaining acceptance into the traditional classrooms for the deaf and hard-of-hearing in a variety of NTID classes as a viable alternative to traditional paper test taking. There are always trade offs, of course, and there are still things that traditional campus test taking can do that remote testing cannot. The application of these remote models depends to a large extent on the student population that it is serving and the comfort level of the instructor using this technology. A less mature audience or students with certain learning disabilities may not be a good fit for this type of assessment.

The evolution of traditional classroom teachers to online testing is growing slowly. It is often more work and not worth it pedagogically for teachers in traditional classrooms to change their method to a more automated way of assessing students. Online or distance learning instructors are more enthusiastically adapting these models.

Most teacher concerns are due to a lack of knowledge and experience of what remote assessment can actually do. These teachers do not have or are unwilling to spend the time to convert and debug their testing methods to an online format.

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Electronic Conferencing in the Classroom

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Abstract: Electronic Conferencing (also referred to as groupware) has become a frequently used tool in both on-campus and remote online learning classrooms. NTID faculty members have gained valuable experience with several electronic conferencing software products. The wide variety of class demographics covered in this paper included all deaf, all hearing and deaf/hearing mainstreamed student audiences in both traditional and on-campus, Distance Learning, and hybrid types of courses, with both traditional-aged college students and adult learners.

Introduction

College students today are constantly on the World Wide Web and regularly checking their email on the Internet. In fact, the United States as a whole is headed this way. The number of Americans with online access has more than doubled from 45 million users in 1998 to 105 million users in 2001. Of Americans with Internet access, the percentage of online users with home broadband access has grown from 6 percent in December 1999 to 19 percent as of September 2001. (Mount, 2001, pp. 44-45) In education and industry, email usage has increased also, as has the use of electronic conferencing. The number of email messages sent by America Online users on the busiest day of the year jumped from under 50 million in 1998 to just under 300 million in 2001(Mount, 2001, pp. 44-45). Although the authors were unable to find minimal usage statistics in electronic conferencing, it is increasing in the same proportions.

This paper focuses on the use of electronic conferencing in the education arena. One author, Kathryn Schmitz, teaches English. The other author, James Mallory, teaches computer programming. Both authors have experience using Blackboard Conferencing, and one author has extensive experience with First Class and the other author is a relatively new user with Prometheus in the classroom. This paper is intended to give the reader a balanced perspective from both a new and experienced teacher/user perspective as well as using electronic conferencing to deliver technical and non-technical courses both in the traditional on-campus manner and in an online format.

The Study

The author's combined anecdotal experience derived in this paper comes from teaching deaf students in a traditional classroom setting and hearing, deaf and hard-of-hearing students in remote online learning classrooms. Data in this paper will come from students directly taught by each of the authors as well as information that was derived from a survey of deaf and hard-of-hearing online learners. The experiences reported in this paper were conducted in search of ways to enhance on-campus and distance learning courses for deaf and hard-of-hearing students. The "findings" are thus merely suggestions for more formal research in this area.

Collectively, the two authors teach 80 to 100 deaf and hard-of-hearing on-campus students each quarter. One author teaches computer programming and the other teaches English to this similar population.

Each quarter RIT averages 30-50 online learners who are deaf or hard of hearing and enrolled in a variety of technical and non-technical classes. One hundred percent of the on-campus students and 85 percent of the deaf and hard-of-hearing DL students described in this paper had access to high-speed Internet connections. Of the online students, 60 percent were deaf and 40 percent were hard of hearing. In this group, 45 percent of these students stated that English was their first language, 45 percent reported that ASL was their first language, and 10 percent stated that a language other than English or ASL was their first language. For the on-campus population, 63 percent of the students reported that English was their first language, 26 percent stated that ASL was their first language, and 11 percent of these students stated that a language other than English or ASL was their first language.

Findings

Integrating Electronic Conferencing into Remote Online Classrooms

Conferencing is crucial in a remote classroom because this contact is the forum where students get to know their instructor and one other. Students reveal their personalities, helping to form an online community, which then helps to make challenging technical courses more palatable and improves retention. Conferencing is crucial when information needs to be shared in an asynchronous, "anytime, anyplace" manner. The drop box feature of conferences lends itself easily to secure submissions of homework assignments.

Integrating Electronic Conferencing into Traditional Classrooms

Conferencing has improved many on-campus courses as well. The online community interaction helped to remove communication barriers between deaf and hearing students and faculty. Passive students who are often dominated by their more aggressive peers in traditional classrooms frequently blossom in an online environment. Different course sections that share common course content have been successfully blended by combining remote hearing and deaf professionals with on-campus traditional college-aged deaf students through electronic conferencing. Students enjoy the luxury of access to course materials and information on a 24-hour/7-day-a-week basis.

Types and Categories of Electronic Conferencing

Of the two categories of groupware used in online learning, one uses Web browsers and the other uses a separate client program. The web browser approach to groupware, such as Blackboard™ and Prometheus™, is often referred to as a "thin client" product. The groupware product that uses separate client programs, such as FirstClass™ are referred to as a "fat client" type of product. Web browsers are ubiquitous, and for most students who are new to online learning, the thin client approach has the advantage of employing a familiar tool with generally familiar navigation. Fat clients on the other hand offer more features and may be faster in some aspects.

Among the most popular fat client products used today are FirstClass™ and Lotus Notes™. Among the most popular thin client products are Prometheus™, Blackboard™, and Web CT. This paper focuses on the experience of the author with three products, Blackboard, FirstClass, and Prometheus. These three products will be compared via survey results from students, faculty, and administrators.

Blackboard

Blackboard 5™, the version of this e-Learning software currently in use at RIT, is easy for students to learn and use. Students use their RIT username and password to log on to the system to access any and all Blackboard-enabled courses for which they are registered. From this common "Courses" page, they can link to a catalog of all Blackboard courses on the campus, to a web search engine, or to the main page of a specific course.

The main page of the course presents them with announcements and a teacher customizable menu of buttons that link them to course documents, assignments, online assessments, a synchronous virtual

classroom, and a variety of communication and support tools. A course map button gives students access to a schematic of the entire contents of the course web site that can be expanded to whatever level of specificity the student requires. Special areas can be created for study groups which are accessible only to group members and the instructor. These include a discussion board, group virtual classroom, file exchange capabilities, and email. Students can also easily create their own web pages, which allows them to express their individuality and share their interests with others in the course. One of the features that students seem to especially like is access to the grade book.

In addition to the "Courses" page, Blackboard offers students two other pages, a "Community" page with a calendar and open discussion board for use by the larger campus Blackboard community, and an "Academic Web Resources" page where students and faculty can access current news, information, and full text articles in a variety of disciplines.

Blackboard is also quite easy for the instructor to use and customize by accessing a variety of functions from the instructor's control panel. Course materials in almost any format can be uploaded with the click of a button. Several textbook publishers provide course cartridges that integrate their materials into the Blackboard program. Email can be sent to selected students or to all students with a mouse click. File exchange between student and teacher using a drop box is another useful feature. A pool of test questions can be created, and unique online assessments constructed from the question pool with only a series of point and click maneuvers. The instructor has complete control over the accessibility of online assessments, including whether or not they are timed, can be taken more than once, and if the students are allowed to view their errors and the correct answers after completing the assessment. The program scores the test and enters the scores automatically into the grade book, a feature that makes online testing attractive to both faculty and students.

Blackboard Negatives

The speed and robustness of a student's Internet connection is a potential constraint on use of an interactive browser-based program like Blackboard. Students with slow dial-up modem connections may have problems viewing or downloading graphics intensive material or even navigating through the course. Students may lose their connection for a variety of reasons, including problems with the dial-up service, and be blocked from accessing a "one attempt" test. Although an indicator appears in the grade book alerting the instructor to an aborted test, there is no way to know if the disconnect was an accident or if the student was trying to get a peek at the test before actually taking it. Students who do not own a personal computer will need to access course materials from a campus lab computer. This may put them at a slight disadvantage to students who have 24/7 access. Finally, while Blackboard is relatively easy to learn, there are a few features that can be confusing. The drop box has two buttons – "Add file" which saves the file to the students own drop box, and "Send file" which sends the file to the instructor. A common error is for students to think they sent their instructor a file when they in fact have only saved it.

Prometheus

Prometheus™ is relatively new and has been available at RIT for about one year. The last time the authors checked, there are more than 30 colleges and universities using Prometheus, compared to more than 1,400 using Blackboard™. Prometheus includes almost all of the same features as Blackboard, noted above, with a few differences.

Prometheus is developed with Cold Fusion, an open-source code, which makes it attractive if the student user needs a customized solution. The product's open-source code allows the subscribers to modify their installation, and the community of Prometheus developers can then share enhancements they have made to their installation. The user community associated with Prometheus will have a lot to do with how successful the open-source code concept will be. Time will tell if the developer community can be effective in developing, testing, and delivering coherent improvements quickly and safely.

One of the most important features of Prometheus are course modules that allows the instructor to teach multiple sections of a course while managing only one set of course materials. The ability to provide direct URLs and link to files within and without the system enhances the provision of information resources. Prometheus also has a mathematics editor so the teacher can enter equations and symbols directly into the system. In addition, the text editor includes various colors and fonts.

Prometheus Negatives

Among the product features, the "Discussion" tool has been heavily criticized for being difficult to navigate. RIT has made a few changes to their installation to improve these difficulties, and more changes are expected to come. Uploading files to the instructor from within the drop box function can be confusing to new users, but that too is being improved. A significant negative to this system is how new material is flagged as unread. The system indicates which section the new material is posted in by showing a small blue circle with a letter in it, such as F for Files or O for Outline, in the user's main page, but upon clicking on the circle, the user is only taken to that section of the system, not right to the new material. In the case of the course Outline section, the user is shown the entire list of sessions with no indication of which one has new material.

Compared with Blackboard, Prometheus' visual appearance is busy and crowded. Course announcements are presented on the login page, not the main page, which students frequently miss in the process of getting right into the course materials. At this time, the text editor in Prometheus does not include a Track Changes feature such as MS Word offers, which would be useful in editing student essays online. In addition, the system has difficulty running movies smoothly at times, even with broadband access.

FirstClass

FirstClass™ has an online chat feature similar to the previously two mentioned software products, which works well for occasional synchronous chats. If a student is not able to participate in the chat, then the discussion can be posted within the conference for later usage.

This system's folders and sub folders are great for organizing and storing items that don't need to be discussed, such as submitted homework and exams. Conferences and sub conferences are ideal for interacting on a topic or for dividing up topics that need to be discussed or shared. It is easy to change permissions in FirstClass so that only a certain student group can access the information in a certain sub older.

The authors found the permission feature useful when combining both remote online courses with traditional on-campus courses into a common conference. As an example, in a C++ programming class at NTID, the on-campus students had a weekly quiz, whereas the remote students only had three tests per quarter. One sub folder was accessible for remote online students only, and another was limited to only the on-campus students. When demo instructional programs were posted, these were posted in a folder that was readable by both of these populations.

FirstClass Negatives

The fact that FirstClass is a fat client type of product requires the user to load the software on each computer that he/she wishes to use. Some students find this to be inconvenient, especially if they are required on their job to work on a variety of computers or if it is an on-campus student and the particular lab they are using does not have FirstClass loaded. The web version of FirstClass is not as functional as the client version.

One must maintain relatively flat folder architecture due to the way in which FirstClass flags messages. A red flag attached to the message indicates a message has not been read. This flag only propagates up one level, so if a folder is several levels down, a newly posted message would not be readily evident. If a folder structure is deep, the red flag would not be seen when a student or instructor first logs into the conference. Another negative using this software is if a message is already marked as read and the instructor wishes to move this message to a sub folder, the message will be moved and pop up as being unread again.

Conclusions

Electronic conferencing is a useful tool in both the on-campus and online classroom. When combined with the other strategies and tools in the classroom, the authors found electronic conferencing a wonderful communication enhancement which leveled the communication playing field and opened up the classroom. It also promoted personal responsibility on the part of the students, who could not so easily claim that the course resources were not available to them since they all were already online 24/7.

In general, the authors found First Class to be a bit more challenging in the beginning to get everything set up and get students rolling, but easier to use and manage once it was set up. Prometheus was easier for students to learn upon startup, but the inadequate flagging of new material made it difficult for the instructor to be sure that students saw new homework assignments or revisions to the course syllabus or outline.

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Evaluating the Effectiveness of Online Instructional and Delivery Technologies for Deaf and Hard-of-Hearing Students

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Abstract: This paper summarizes the authors' findings for student ratings of the variety of instructional technologies used for RIT's online learning courses and discusses implications for deaf and hard-of-hearing learners. The authors have been using varied technologies for delivering instruction and interacting with both on-campus and Distance Learning (DL) classes for many years with deaf, hearing and hard-of-hearing students. Some of the technologies used include electronic conferencing, VHS tape and web-streamed videos, web based instruction with text and graphics, digital video conferencing, multimedia desktop capturing simulation, sample source code and executable programming examples and Windows Media Player.

Introduction

For the past two years, the authors have collected data from deaf and hard-of-hearing students who participated in both on-campus and DL classes in an effort to better understand the advantages and disadvantages of the DL format and delivery methods for deaf learners. There is very little data or information currently available about deaf, online learners regarding which components of online learning are important for their mastery of course material. The presence of the National Technical Institute for the Deaf (NTID) on Rochester Institute of Technology's (RIT) campus with 30 - 50 deaf and hard-of-hearing students enrolled in Distance Learning (DL) courses each quarter provides an opportunity for examining these DL learners.

Because of the authors' interest in the topic and the lack of information available, two questionnaires, with overlapping items, were developed to obtain deaf students' perceptions of the DL experience. One questionnaire was general to all RIT DL students and a second was specific to computer programming courses taught in the Applied Computer Technology Department on campus. This paper focuses on the questionnaire for all of the deaf DL learners at RIT for the fall, 2001 quarter. This questionnaire consisted of 35 items, (12 demographic, 6 open ended, and 17 Likert items) which asked students to rate the importance of various instructional components for their overall learning. Students were asked to rate on a five-point scale from "not important at all" to "very important" the following course components:

1. Testing and Interactions
2. Groupware Conferences
3. Web, Textbook and Instruction, Videotape
4. Homework and Interactions

A sample of the online survey can be seen in (Fig. 1) below.

Please indicate how important each of the following course parts was for your overall learning in this course. Please read the entire list before rating items.

Testing and Interactions		Not Important at all	Not Very Important	Somewhat Important	Important	Very Important	Not Applicable to this Course
13.	Proctored tests	○	○	○	○	○	○
14.	Feedback on the tests	○	○	○	○	○	○
15.	Live classroom explanations/discussions with the teacher	○	○	○	○	○	○
16.	Individual tutoring sessions with the teacher	○	○	○	○	○	○
17.	Tutoring help from friends, colleagues, or classmates	○	○	○	○	○	○

Figure 1: Likert Question Samples from the RIT Online Survey

The Study

Procedure

Thirty-three students with a declared hearing loss enrolled in online learning courses taught at Rochester Institute of Technology (RIT) during the fall, 2001 academic quarter. Twenty of these students responded to a 35-item questionnaire that was administered online at the end of the quarter. Respondents were entered into a lottery and two individuals were randomly selected and received a $25.00 gift certificate for their participation.

Subjects

Participants were volunteers who were enrolled in graduate (30%) and undergraduate (70%) courses at RIT during Fall Quarter 2001. Approximately 35% of the students were enrolled in applied science/computer science courses, while the remainder of the students, (65%), were enrolled in liberal arts or business courses.

Sixty percent of the respondents considered themselves deaf while (40%) considered themselves as hard-of-hearing. An equal percent of respondents indicted that their first language was English (45%) said that their first language was American Sign Language (ASL)(45%). Ten percent of the sample was deaf students who indicated that a language other than English or ASL was their first language.

Findings

As a group, the respondents were not new to online learning and expected to do well in the present class. Seventy-five percent of the students had participated in a DL course prior to this one and 65% of the students indicated that they had used electronic conferencing before. Eight percent of the students expected to receive either an A or B in the course they were evaluating.

Communication

Instructor and student comments posed on an electronic conferences were seen as important or very important for students' overall learning by (80%) and (70%) respectively. The following comments from students further clarify how the electronic conference was important for their learning.

> *"Everyone has a different insight of quality management. The students that I am in class with has different background in their job, when they share their experience, you can see overall that not all management is the same or effective."*
>
> *"I like this course because it is easy to communication with teacher and student at anytime, I mean 24 hours a day to contact him instead of sign up on the door to see him in person."*
>
> *"Very effective and simple. I have a problem, immediately contact the teacher and will hear from them asap!~ I love it!"* (Mallory & Long, 2001)

Sixty-five percent of the students indicated that the textbook or materials developed by the instructor were important or very important for their overall learning. Similarly, (60%) of the respondents indicated that a reference book was important or very important for their overall learning. Less traditional approaches for delivery of instruction web text, and graphic-based explanations, were rated as important or very important for overall learning by (40%) of the students. Lastly, feedback on the class tests was rated as important or very important for learning by (50%) of the respondents. These ratings take on more meaning when the following student comments are added to the total picture:

> *"It's a wonderful textbook."*
>
> *"Online quiz can be taken over till you get 100%."*(Mallory & Long, 2001)

Homework

A real strength of online learning seems to be the availability of feedback/comments related to homework assignments. Eighty-five percent of students felt that teacher's written explanation of homework was important or very important for their overall learning. Seventy-five percent of the students perceived online interaction/comments by the instructor and fellow classmates as important or very important for their learning from homework.

Deafness and Distance Learning

When asked, "What did you like about distance learning," 35% of the students indicated that the flexibility and pact of the learning were attractive features. Examples of these comments are:

> *"The flexibility of doing things on my own pace, with a time frame."*
>
> *"I can do this on my own time, it frees me from having to go to boring classes."*
>
> *"...going at my own pace is excellent about distance learning, and it makes my schedule more flexible ____ not requiring class attendance."* (Mallory & Long, 2001)

Thirty percent of the respondents indicated that one of the advantages of distance learning for a deaf or hard-of-hearing learner is the ease of communication. These student comments are illustrative:

> *"ability to communicate freely without barriers."*
>
> *"Everything is text based and hearing isn't a problem."*

"freedom of participation" (Mallory & Long, 2001)

The following statement by graduate student presents a direct comparison of the traditional classroom and the distance learning format for a deaf learner:

"I think I am a natural distance learning student! For my bachelor's I was in terrible shape since I couldn't really follow what was going on in the classroom. I didn't know enough sign to really understand the interpreters, the material moved too fast for me to get it from the instructor, so I felt I was a bad student and so on, so my GPA was horrible even though I honestly worked hard. I was lucky to have graduated with a 2.5 GPA. Now through distance learning I get the exact same material presented in the exact same way as everyone else in the class, hearing or deaf. It makes no difference, and I am able to make a positive contribution. I'm much more confident because I don't have the doubt that I'm missing something just said. For my Master's I have a 3.9 GPA, my sole B was, ironically, not a distance learning class but in a classroom, and on top of that without an interpreter available, and with a lot of classroom discussion. So I doubt I'll take an in-class course if I can ever help it." (Mallory & Long, 2001)

Finally, when students were asked, "What did you not like about distance learning?" thirty-five percent of the students said "nothing." The remaining comments focused on feeling more isolated in the distance learning format:

"No class discussion."

"I missed the interaction with teacher and peers on RIT campus."

"Students in telecourses sometimes feel isolated ... sometimes miss the real-timing face-to-face interaction." (Mallory & Long, 2001)

A couple of students mentioned that a distance-learning student needs to be disciplined:

"I do not have the discipline for it."

"Having to check FC on more than a daily basis. Too many things were done last minute and I couldn't keep up." (Mallory & Long, 2001)

Conclusions

This paper verified the preference that deaf students have for most aspects of a virtual, asynchronous type of classroom over a traditional on-campus classroom. Many RIT students saw the "flexibility" of the DL format as its most positive aspect. This perspective was reflected by one student who said "I like being able to do the homework and tests when I can." Other deaf students pointed to increased ease of communication allowed by online learning, "I like to sit by my computer and discuss with the teacher as much as I can, compared to the classroom where I will have to listen to the professor and have a limited time to discuss." (Mallory & Long, 2001) Frequently the asynchronous aspect of DL learning is mentioned as a preferred means of gathering knowledge and communicating.

The results from this paper with deaf and hard-of-hearing online learners in many ways is consistent with findings by Long and Richardson in a study at the Open University, London, England with approximately 200 deaf and hard-of-hearing adult respondents. (Long & Richardson, 2000) The English deaf and hard-of-hearing students were older, average age of 50, compared to this paper's study where 45% of the students were 23 years old or less, 35% were 24 – 30 years old, 20% were 31 – 40 years old and 0% were over 40. In the Long and Richardson study, deaf learners were positive about the flexibility and pace of the online learning environment. Deaf learners also pointed to the ease of communication in this environment as compared to a more traditional classroom setting. In some ways, it appears that this instructional format helps "level the playing field" for deaf learners.

One of the potential side effects discovered in the England study which was not found to be true with the RIT population with this new mode of interacting with teachers and peers was a reported sense of isolation. One deaf respondent in the Long and Richardson study said "I often feel isolated from others when taking a DL course, but as a deaf learner I am used to that" The feeling of isolation would represent a small percentage of the population from the author's perspective and data described in this paper. The authors' felt that this was due to the lack of proper considerations and accommodations for the delivery and conferencing systems used in England. This situation did not seem to exist at the RIT classes, as all the video types of instruction were captioned or developed with the deaf audience in mind. Online communities were actually developed while students regularly interacted with each other asynchronously within the electronic conferences. In fact, Mallory used electronic conferencing to successfully combine remote, online hearing and deaf students with traditional on-campus college aged deaf students taking programming classes into one large online community. (Mallory, 2001) This diverse population of young, college aged deaf and hard-of-hearing students regularly interacted with deaf and hard-of-hearing adults who were out working full time in the corporate world. One remote class of hearing adult Pittsburgh Telephone company technicians were also integrated with deaf on-campus and corporate programmers in a C++ programming class.

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Integrating Multimedia and Video Streamed Instruction into a Deaf and Hard-of-Hearing Classroom

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Abstract: Multimedia and video streamed instruction delivered remotely via the web is becoming more prevalent for both the deaf and hearing Distance Learning (DL) population. Video streaming is becoming more popular because more students are connected to the Web at higher access speeds at home, work or school. Multimedia instruction is becoming more viable due to computers with faster CPU speeds, more RAM memory and larger hard disk storage.

There are various factors to consider when an instructor incorporates video streaming or multimedia instruction into their remote or on-campus lesson plans. Some methods are cost effective and simple to implement, while others are more expensive and complex, with longer learning curves. Some of the multimedia concepts discussed in this paper include the use of screen capturing software, screen graphic tools, video streaming from small desktop cameras and the use of camcorders for recording streamed videos.

Introduction

Today there are many cost efficient ways to deliver instruction to a remote audience, regardless of whether they are deaf, hard-of-hearing or hearing. The tools used and discussed by the authors in a "Multimedia Toolbox" include:

1. HiLighter™ – a screen visual tool, which turns a computer monitor into a flexible, artistic means of displaying and emphasizing information. Screen enhancement tools such as HiLighter cause computer generated presentations to become more lively and clear.
2. Snagit™ - A monitor sequence capture program which captures a computer screen and saves and stores it in a variety of different formats (*.bmp, *.jpg, *.tiff, etc.).
3. Camtasia Recorder™ – A monitor sequence capture software program which captures a computer monitor's sequence of events, allowing the instructor to deliver step-by-step animated instructions. This can be stand-alone instruction or used in conjunction with text and graphic based explanations.
4. Video Streamed Instruction, using sign language, recorded by: a digital camcorder; a small Logitech Camera mounted to a laptop computer; a studio grade production camera (and also streamed simultaneously with computer monitor captures, captioning and audio.

The Study

Multimedia tools

Multimedia screen tools were studied and initially tested in order to discover the best way to deliver technology instruction to a remote deaf and hard-of-hearing audiences. These tools proved to be extremely useful for delivering instruction to traditional classroom students and in other presentations as well. Streaming was studied as a way to incorporate sign language with other aspects of remote instruction. This paper will describe the authors' successes and failure in these areas. The authors hope that the findings in this paper will provide suggestions for more formal research in the future.

The authors at the National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT) investigated the use of "smart" white boards for delivering online Visual Basic (VB) instruction. This was found to be awkward, due to the need for the teacher to move around and also be able to use the computer. Shadows resulting from using sign language and front projections caused interference in the visual communication, the primary means of communication for most of the deaf and hard-of-hearing students. Rear projection may have been a feasible alternative, but was cost prohibitive. A more acceptable solution was to turn the computer monitor itself into a usable white board. There are two software products that allowed use of the monitor as an online classroom white board – Altiris HiLighter and TechSmith's Camtasia. HighLighter allowed graphics and text to be drawn on the monitor while Camtasia captured any movements or action which occured on the monitor.

HiLighter™ is a unique, desktop enhancement software which is easy to learn and will allow the remote instructor to use his/her monitor as a whiteboard for instructional purposes. Some of the HiLighter features include:

- Draw on-screen with transparent or solid color pen (similar to a television sportscaster)
- Zoom in on a user-defined area of the screen
- Shine a spotlight of any size or contrast around the screen
- Point arrows or other icons of any size to any screen location

HiLighter is produced by Altiris™ and can be found at: http://www.altiris.com/.

SnagIt™ is a tool that can produce customized screen captures with the press of a hotkey. SnagIt capture software will capture images, text, and video from a Windows desktop. Snagit allows the instructor to capture text or graphics from all applications, even those that don't offer Cut and Paste. Images from Web sites, scanners, digital cameras or anything that can be seen on the computer screen can be captured. Captures can be sent to a file, the clipboard, the Web, as an e-mail attachment or posted on an electronic conference for the benefit of the remote audience. Snagit is a Techsmith™ product. (www.techsmith.com)

The use of moving pictures or animation to supplement text-based instruction is invaluable for explaining complicated course content to a deaf or hard-of-hearing remote audience. Camtasia™ captures the action and sound, (this is irrelevant for our deaf but not our hard-of-hearing audience) from any part of the Windows desktop and saves it to a standard AVI movie file or streaming video. The Camtasia screen recordings can then be posted on the remote course's electronic conference, shared on a Web site, or distributed via e-mail, an Intranet or CD. Camtasia is also a Techsmith™ product.

The first author successfully explained to a remote deaf audience how to construct computer programming designs in Visual Basic (VB) software code. The VB graphical user interface design and properties as well as the coding of each object could be exactly described within one instructional unit using this type of software.

Video Streaming

Video streaming can be thought of as a progressive downloading of a video file. Instead of waiting a long time for a movie to be downloaded to one's desktop all at once and then viewing it, the video is fed or "streamed" in small units of information at a time and is viewed as it is being downloaded. Streamed video is much more conducive to viewing large video files that may last from many minutes up to an hour or more. The video could be live or prerecorded and stored on digital media.

The three most popular video file types are Quicktime™, an ".mov" type of file, Microsoft Media Player™, an ".avi" type of file, and RealPlayer™, a ".rm" type of file. RealPlayer became the streaming software of choice for most of the NTID projects. Real Player works on both Macs and PC's. It has a proven track record in the streaming video arena. It was found to be complicated when embedded into HTML, however. When a RealPlayer streaming presentation contains multiple clips, such as sign language videos, computer screen images, captioning, etc., it needs to use the Synchronized Multimedia Integration Language (SMIL) to coordinate all of the parts. SMIL is a simple but powerful markup language for specifying how and when clips play. A SMIL file is not required to stream just one clip, so if an

instructor wanted to simply send a streamed video clip with sign language, dealing with the SMIL file would not be necessary and this would greatly simplify the implementation of streaming. When multiple clips exist such as in the project described by the authors below, the process becomes much more complex because more than one stream is involved and a SMIL file needs to be used. After writing the SMIL file, the video is then ready to put on the RealServer and link to the Web page.

NTID has experiences with a large variety of streaming video projects and pilots — several conducted by the authors are described in this paper.

Visual Basic Programming

A pilot study implemented by the first authorinvolved delivering Visual Basic Programming instruction remotely to students enrolled in either on-campus or distance learning programming courses offered by the Applied Computer Technology Department. Each video streamed unit was linked from the teacher's instructional web site, which can be viewed at: http://idea3.rit.edu/jmallory2/vb/. RealPlayer and SMIL were used to simultaneously stream four events at the same time, including the computer monitor, sign language, audio and captioning. These multiple streams captured the Visual Basic (VB) programming demonstrations and were stored on a server and accessed asynchronously. These streamed files can be accessed in the "Visual Basic" folder located at the URL: http://nisvideoserver.rit.edu/OnlineWhole.htm. If the user needs to download a free version of Realplayer, it can be found at: http://www.real.com/. These video streams are best viewed using a recent version of Internet Explorer.

A hand held Panasonic camcorder was also used to record student responses during a national, week-long Visual Basic Programming workshop that he offered on campus to alumni who came from across the country. The participants' comments were recorded with the camcorder and posted on the server after the addition of captioning. These can be found in the "DIIT VB Workshop" folder located at the URL: http://nisvideoserver.rit.edu/OnlineWhole.htm.

Technical Signs

The authors also developed some pilot modules illustrating technical sign language for a forthcoming in-depth study of signs used for science instruction of deaf students. Using desktop Logitech™ cameras at several locations and in two different formats available from Logitech (*.exe file and *.rm file), several streaming videos were produced to evaluate the quality of reception on different platforms. These can be seen in the "Pilot Modules" folder at the URL: http://nisvideoserver.rit.edu/OnlineWhole.htm.

Streaming videos in *.mov format were easily produced with a digital camera and embedded in html as part of a National Science Foundation grant titled *Clearinghouse On Mathematics, Engineering, Technology and Science* (COMETS). Several "Video Examples" are shown at http://www.rit.edu/~comets/pages/cos/signguidelines.html.

Classroom of the Sea

The third video streaming pilot study involved the Classroom of the Sea (COS), also a National Science Foundation sponsored grant project. COS involves a collaborative team from the National Undersea Research Center for the North Atlantic and Great Lakes, University of Connecticut, American School for the Deaf in Hartford, and the second author of the present paper at Rochester Institute of Technology. To develop a means for communicating in sign language with high quality transmissions over the Internet, VBrick™ from VBrick Systems (www.vbrick.com) was used to set up a "vbx server". Ivar Babb and Peter Scheifele worked with their technical staff in using a digital video camera with the deaf students on a boat, the *RV Connecticut*, on the Atlantic during a water sampling activity. This signal was fed into the RV Connecticut's network and then transmitted from the vessel to the antenna on the Marine Sciences building into the building's LAN. From there it was picked up/split to 1 or 2 Vbricks to test the high quality imagery coming to the shore. One of these signals was sent to the vbx server which will trans code the signal to Windows Media™. This was the streaming format for viewing the web video with Streamplayer2™. The transmissions could also be viewed on the project's web page. Both a static video camera and a mobile camera were used to transmit the messages in American Sign Language describing the at-sea research.

Findings

Multimedia Tools

All of the multimedia tools, HiLighter, Snagit and Camtasia, worked well when creating instruction to be directly delivered or when embedding instruction into streamed videos for use with deaf and hard-of-hearing students in remote locations. HiLighter was also found to be useful for working with visually impaired students in the computer labs on-campus.

Video Streaming

Technical Signs

The video stream modules produced with a Logitech QuickCam™ were successfully sent back and forth via email and posted them on the web using both a PC and an iMac. Logitech's software allows the user to create and save the video as either a *.exe or *.rm file. These streaming files are very easy to create and email to people. Storing them on a server proved to be a bit more challenging due to software requirements and conflicts. In addition, only PC's can read the *exe type of Logitech file, whereas both PC's and Mac's can read the *.rm type of file. These two formats can be viewed at seen in the "Pilot Modules" folder at the URL: http://nisvideoserver.rit.edu/OnlineWhole.htm, and also at: http://www.rit.edu/~jrmnet/Streaming/Index.htm. The sign language was of fairly high resolution when a video was sent via email or stored on the server. Live video, depending on the connection, can be choppy, as found in the pilot study with the Classroom of the Sea project. The authors' felt that this was due to the connection topology as found in the study done by Mallory and Laury (2001) at NTID. In this study, desktop cameras and various network topologies and connections were studied as part of Laury's Master thesis. (Laury, 2001; (Mallory & Laury, 2001). One challenge reading the *.rm files produced by Logitech was not due to the Logitech software itself, but rather due to bugs in browser software. At first, the authors could view the files from a PC but they did not work with a Mac G4. The use of Netscape™ appeared to be the problem. Microsoft's Internet Explorer™ proved to be far easier to read files that were posted on a server. Conflicts arose depending on which was loaded first, the browser software or RealPlayer. Browsers often contain their own version of RealPlayer, so conflicts can occur if Realplayer is loaded separately. The browsers in this pilot had to be reloaded so that there would not be a conflict when running the streamed videos. More systematic study is needed under the four conditions (Mac/Netscape, Mac/IE, PC/Netscape, PC/IE).

Visual Basic l Project

Assistance was obtained from NTID's Instructional Television and Technical Services departments in an attempt to develop high-end, multiple streamed instruction which could be remotely and asynchronously accessed by students. Capturing a video and digitizing it is relatively easy. Converting the video-to-video stream into Real Player format is the difficult part if multiple streams are being combined; otherwise it also a fairly simple process. The easiest way to record a video is to have a camcorder that is digital and a connecting Fire Wire. This will allow the user to directly port the movie into the computer in a digital format. This movie can then easily be edited with a product such as Adobe Premier or other similar product. This would produce a high quality video. An analog camcorder could be used with the standard Audio Visual (AV) ports and a video capture card on a computer. Using this method requires more steps, because the movie has to be converted from analog to digital by going through the AV port and back. This method would work, but the video quality would degrade.

Streaming of the video is the most difficult part of this process if the developer is synchronizing multiple streams. If only a recorded video of sign language is being posted, the procedure is quite simple. The goal is to code the streamed video onto a web page for asynchronous viewing. The clearer the movie file is to view, the larger its file size will have to be. There is a trade-off between what file size is adequate to be able to understand sign language and the instruction when it is streamed to the user's desktop and what is a practical file size to store and stream video over a broadband connection. For video by itself, 15 frames per second throughput is normally fine to adequately view on the web. When combining multiple streams as mentioned above in the Visual Basic Programming instruction, however, throughput of 30 frames per second is recommended for the best clarity. The signal speed and clarity will tend to degrade as the various streams are combined and posted on the web. There are various PC Video editing software available. One product, Adobe™ Premier™ runs on either platform and was chosen for this project. There is also another Mac based video editing software, named iMovie, which is very popular. A large capacity server needs to be used for video stream hosting. A good "rule of thumb" to use is video typically consumes one megabit per minute for an average video.

Conclusions

Multimedia tools such as HiLighter, SnagIt and Camtasia can be used very successfully in delivering instruction to remote deaf and hard-of-hearing students. Video streaming is also ready to use for this same instructional purpose, but it is still not perfected yet due to a variety of evolving technology factors related to browsers, various streaming formats and connection speeds of the end users.

The authors found the streaming implemented for the Visual Basic Programming Course to be satisfactory. Primary concerns in this pilot project were related to the synchronizing of four different streams into a single instructional video, which demanded higher bandwidth. The streamed VB instruction worked fine, as long as the audience was connected at a high-speed Internet connection and used a recent version of Internet Explorer and RealPlayer. Using a Netscape browser, a low speed connection or a loaded system rendered the multiple streamed videos unacceptable.

During the initial tests of live video streaming, the streams were found to be very good quality for understanding sign language and seeing the science students working, although the signals were choppy at times, and at other times frozen for a while. Much was also learned about how to place the camera and, especially, use proper lighting for the primarily visual communication among deaf people.

Continued study of these technologies will assure enhanced streaming video quality in the future instruction of deaf and hard-of-hearing students, who will certainly benefit from the highly visual nature of these products.

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Synchronous, Remote, Internet Conferencing with Deaf and Hard-of-Hearing Students

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Abstract: This paper focuses on the authors' experiences with interactive, synchronous internet video conferencing with deaf and hard-of-hearing students in two different settings. One setting involved teaching computer programming to remote deaf and hard-of-hearing students. Within the realm of this remote teaching, synchronous, remote tutoring was set up using Desktop Video Conferencing (DVC) using Logitech cameras and Microsoft's NetMeeting software. Another setting involves a science project that used one static and one mobile camera with Vbrick™ software to transmit sign language communication from a boat at sea to computers located at the university.

Introduction

In the past, distance learning with two-way video was out of reach for many remote students and institutions. Recent innovations in telecommunications have lowered equipment and transmission cost, making two-way desktop video feasible for businesses, classrooms, libraries, and even homes. In the education of deaf students, video conferencing is also becoming more prevalent due to the inexpensive pricing of desktop cameras and hand-held camcorders as well as the increased access speed at which the deaf and hard-of-hearing audience is accessing the Web.

The horrendous events of September 11th have also discouraged travel and encouraged the use of remote interactions. For example, one of the authors, who himself is deaf, was supposed to travel to England to present at a conference in mid September but "due to the disruption caused to flights from America following the terrorist attacks Dr. Lang was unable to attend" (Evening Telegraph, 2001, p. 2). An mm225 ISDN dual mode videophone was used in Derby, England, to project the speaker on a large screen. The presenter transmitted his lecture on the topic of video telephony from the Rochester Institute of Technology in Rochester, New York, to the conference in Derby, England. Remote interactions as demonstrated by this example are becoming more prevalent with the advance of technology.

In this paper, the authors share their experience in two different arenas. One area is teaching computer programming courses to deaf and hard of hearing students in remote locations. In these courses Desktop Video Conferencing (DVC) was used in remote, synchronous tutoring sessions. Initial experiments in delivering science concepts and sign language from a boat with deaf students and their teachers out at sea will also be briefly summarized.

Affordable broadband connections and technologies at home, work and school are rapidly growing. These high-speed connections are changing the capability of carrying large amounts of text, voice and video data over existing telephone and cable lines. Microsoft summarized the technology in a very concise manner: "For years now, computer networks such as the Internet have been carrying text-based

messages around the world. Most often, these messages take the form of electronic mail, though real-time chat programs are also used. As the quality and speed of computer networks increase, so do demands for higher levels of interaction that include voice, graphics, and video exchange in real-time. This growing trend toward richer communications via computer is known as Internet Conferencing." (Microsoft, 2001, USA-L_News@yahoogroups.com)

Various researchers have investigated the transmission of sign language, which features significant motion of the arms and hands, and requires a frame rate high enough for smooth motion perception (Schumeyer, Heredia, & Barner, 1997). Science teachers such as Mary Ellsworth at the Model Secondary School for the Deaf in Washington, DC (http://csc.gallaudet.edu/soarhigh/SHMAHOM.HTM), have also previously experimented with computer-based videoconferencing over ISDN lines. Such research and instructional efforts are pioneering. Educators of deaf students eagerly await progress with the new technologies.

The Study

The experiments reported in this paper were action research projects conducted in search of ways to enhance distance learning. The "findings" are thus tentative and provide suggestions for more formal research.

Most of the Distance Learning (DL) courses at Rochester Institute of Technology (RIT) and the National Technical Institute for the Deaf (NTID), one of RIT's colleges, have focused on asynchronous (any time, any place) delivery of instruction. After teaching multiple remote, DL computer programming courses to a deaf and hard-of-hearing audience, however, it was found that both synchronous and asynchronous types of online instruction are necessary for some students to have a successful distance learning experience.

One author tutored remote deaf and hard-of-hearing students via a QuickCam Desktop Camera in conjunction with Microsoft's NetMeeting as an asynchronous tool for clarifying concepts with one deaf student and one teacher. This is often referred to as point-to-point video conferencing, where only two people can talk and see each other at a time. Although this hardware and software can easily incorporate group conferencing of remote students by the instructor, the project reported on in this paper involved only point-to-point video conferencing. The students selected were tutored on an individual basis in a credit-bearing DL course in Visual Basic Programming.

Desktop Video Conferencing (DVC) is one of many different types of conferencing tools. The DVC components include a video conferencing camera, such as the QuickCam camera used for this project, an Internet telephony application, a microphone, and speakers mounted to the local computer (the microphone and speaker built into a laptop computer were found to be adequate). DVC links two or more participants at different sites by using computer network(s) to transmit data. DVC is based on Codec (compressor-decompressor) technology. A Codec works via a mathematic computer algorithm to compress and decompress digital data. The data can be video, audio, or text based. A Codec is an important part of any Internet telephony application such as Microsoft's Netmeeting.

To use Desktop video conferencing, the student and instructor both need to have a computer, a camera, and an Internet connection to send and receive the video. From the authors' experience, the computer should be a Pentium-based PC running on Windows 95, 98, NT or Windows 2000. The authors have no experience with the new XP, Linux or other operating systems yet. The faster the processor speed the better the video will run. All the Pentium based processors are more than adequate to handle DVC. The user should have at least 32 MB RAM, although more memory will be better, especially if the user plans to have other applications open when using DVC. The PC should have enough hard disk space for file swapping; at least 20 MB would be a minimal requirement. A video capture card is also necessary.

The Internet connection for conferencing should be as fast as possible. It is recommended that both users be connected at speeds much faster than the Plain Old Telephone System's (POTS) 28.8 kb per

second. A Local Area Network (LAN) with Roadrunner™, Integrated Services Digital Network (ISDN™), the Digital Subscriber Line (DSL™), or T1 connection would be optimal. Temasek Polytechnic does an excellent job of laying out system requirement and step-by-step instructions on how to set up DVC on their website. (Temasek Polytecnic, 2001, http://eicu.tp.edu.sg/DVC/index.htm)

The camera chosen should be a desktop type of camera that easily interfaces with the computer. Although the QuickCam had many features for storing photographs, it was the video feature of the DVC and the low price that was the most appealing for the project discussed in this paper. The QuickCam camera is capable of recording video at up to 30 frames a second.

Classroom of the Sea Experiments

The Classroom of the Sea is a National Science Foundation sponsored grant project with a collaborative team from the National Undersea Research Center for the North Atlantic and Great Lakes, University of Connecticut, American School for the Deaf in Hartford, and the second author at Rochester Institute of Technology. To develop a means for communicating in sign language with high quality transmissions over the Internet, VBrick fromVBrick Systems (www.vbrick.com) was used to set up a "vbx server". A digital video camera was used with the deaf students on a boat, the RV Connecticut, on the Atlantic during a water sampling activity. This signal was fed into the RV Connecticut's network and then transmitted from the vessel to the antenna on the Marine Sciences building into the buildings LAN. From there it was picked up/split to one or two Vbricks to test the high quality imagery coming to the shore. One of these signals was sent to the vbx server which transcoded the signal to Windows Media. This was the streaming format for viewing the web video with Streamplayer2. The transmissions could also be viewed on the project's web page.

Both a static video camera and a mobile camera were used to transmit the messages in American Sign Language describing the at-sea research. Initial experiments proved successful. The ability to read sign language over the Internet was of sufficient quality to continue planning for two-way transmissions on an ongoing basis. Experiments with classroom lectures, including the use of Power Point slides, using this system were also successful. This will allow the team of scientists and educators in four different locations to interact during various science learning excursions with deaf students.

Conclusions

DVC is both inexpensive and easy for instructors and students to implement. The technology significantly enhanced remote tutoring sessions by making remote interactions more personal. Communication with the deaf and hard-of-hearing relies heavily on facial expressions, body language and gestures. DVC, when combined with the other tools mentioned in this paper, provided an adequate environment for successful remote tutoring sessions.

In distance learning tutoring for the deaf and hard-of-hearing, DVC is often too slow and choppy for fluid, extended sign language conversations, but it does allow the sharing of some limited sign language, gestures, facial expressions and body language. This real-time interaction significantly enhances chat sessions and white board viewing of instructional material such as text explanations or computer program source code. Netmeeting also allows the use of highlighting and drawing on top of instructional materials, which can easily be posted on the online white board or even saved later in an electronic conference.

Video conferencing is becoming more affordable as use of broadband connections and technologies such as ISDN, DSL and Road Runner at home, work and school increase. These high-speed connections will change the capability of carrying large amounts of text, voice and video data over existing telephone and cable lines. Videoconferencing systems also incorporate compressed digital video. This

compression technology makes the transmission of video less costly by reducing the size of the video needed to be transmitted.

Broadband access has also impacted DVC and other types of video conferencing. A survey taken last year of 2000 online RIT students, of which 50 were deaf, gathered a 10% response rate and found that 70% of these students had access to broadband Internet access at home, work or school. (Fasse, 2000) Of the 20 respondents to a fall , 2001 academic quarter survey of exclusively 33 RIT deaf and hard-of-hearing online students, 85% of these learners had access to high-speed internet access while 100% of all on-campus students have capability to this access. (Mallory, Long, 2001) According to AOL, Americans with online access has increased from 45 million users in 1998 to 105 million users in 2001. Of these online users, those with home broadband access has grown from 6% in December, 1999 to 19% as of September, 2001. (Mount, 2001, pp. 44-45) This shift in the access speed of the student population makes video streaming an increasingly viable option for delivering synchronous communication and instruction.

Desktop Video Conferencing (DVC) is a widely available, low cost, practical technology that can be used in synchronous, online tutoring/teaching sessions. Although the limited throughput on the Web makes it challenging to observe sign language in a fluid and practical manner as a primary instructional or conversational tool in online courses, it has been useful as one means of tutoring remote deaf students when used in conjunction with a complete DVC package. A DVC package with a desktop camera allows the sharing of some sign language, gestures, facial expressions and body language. This real-time interaction significantly enhances chat sessions and white board viewing of instructional material such as programming code. Netmeeting also allows the use of highlighting and drawing on top of instructional materials, which can easily be posted on the online white board along with a chat session interaction.. When the DVC video was combined with Microsoft NetMeeting's other features, the total package was found to be an excellent communication and instructional tool.

The hardware, software, and Internet connections are now available to provide a complete Internet conferencing solution such as DVC at a very reasonable price. DVC incorporates the use of desktop cameras and software that can provide an adequate environment to perform remote, synchronous tutoring for deaf and hard-of-hearing students. With the increase in digital compression technology and students increased connectivity at high-speed, broadband access speeds, use of digital video conferencing will continue to grow.

Preliminary experiments with the VBrick software also show promise. In order to keep the education of deaf and hard-of-hearing students abreast with the rapidly growing distance learning opportunities, these and other emerging technologies need to be continually explored for successful synchronous instructional efforts -hearing learners over the Internet.

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Model of a Planning Strategy for Online Courses

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Abstract: This paper is a report on the findings of a study that utilized a modified Delphi method. Forty four faculty from eleven universities participated in this study and developed a planning strategy for the development of distance/online courses. Along with the model there were 42 factors and 135 sub-factors generated from the analysis of the data. Also included in this report are the model and the steps of utilizing the planning strategy.

Introduction

Advanced digital and electronic technologies are influencing instructional activities and redefining the meaning of formal education realities. Using these technologies education can no longer confined to a walled classroom and is accessible at any time, place and context. This transformation poses new challenges to educators, especially when effectiveness and efficiency of teaching and learning is concerned (Simonson, 2000).

A few years ago various digital and electronic technologies were used individually for different forms of distance education (Rosenberg, 1998). However, in the contemporary distance education settings most of these technologies are integrated to meet the demand of the dynamic and sophisticated teaching and learning activities (Dede, 1997). As a result, technologies that are used in distance/online courses are no longer selected based on the suitability and logistical reasons but are driven by how effective and efficient these technologies can be used to promote optimal learning.

Challenges in Distance Education

There are many attempts made by scholars to define distance education. They claim that distance education could be an effective form of education if it is properly planned, developed and implemented (Holmberg, 1995). However, there are disagreements among these scholars on what should constitute distance education. Based on this argument, therefore, it is critically important for educators to consider various teaching and learning factors before designing and developing distance/online courses.

Planning and developing instruction are always major issues in distance education (Moore & Kearsey, 1996). Distance educators who advocate the use of the systematic approach of planning instruction see its usefulness (Seels & Glasgow, 1998). Those who oppose to this approach argue about its ability to promote "reflection" and "real-world context" during its implementation. However, both groups agree that the utilization of the systematic approach for planning instruction have many advantages to promote effective instruction

There are many incidents where distance educators are unable to effectively implement their distance courses (Ndahi, 1998). This problem is related to the misuse or misunderstanding about data to be used and lack of a desired planning approach to properly design and develop their distance courses. The problem becomes even more alarming when these educators have limited understanding of the interaction of the many factors that are involved in the planning for the development of distance/online courses.

Model of Planning Strategy

This model (Figure 1) is developed using a modified Delphi method that involves forty four faculty from eleven universities. Unlike models of Instructional Design, the primary purpose of the model is to help educators in the planning phase of the development of distance/online courses. Major emphasis is given to assure that the right decision can be made before designing and developing distance/online courses.

The model constitutes of eight elements that are important to be considered before converting a traditional course into a distance/online course. In each element there are several factors and sub-factors (Table 1) that need to be addressed in order to make a sound decision. Although the elements of the model are presented in a sequence, however, the planning process for the development of distance/online courses can be started from any of the elements.

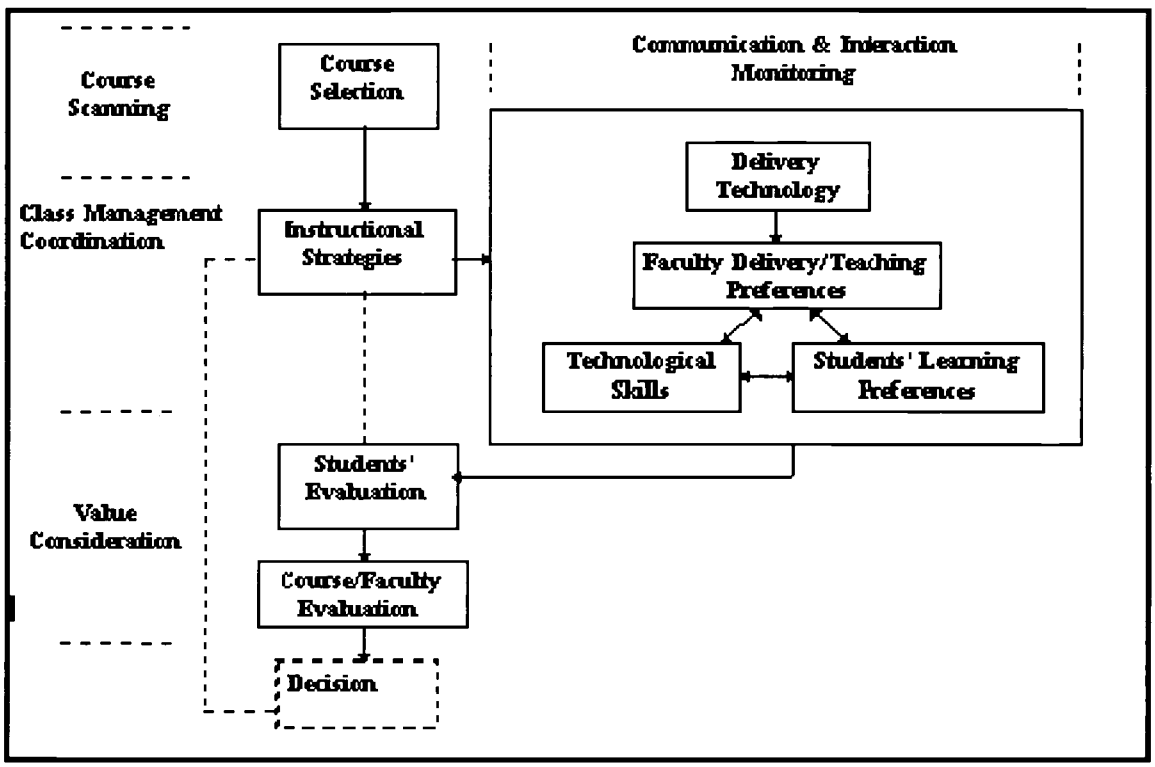

Figure 1. A Planning Strategy for the Development of Online Courses

Factors (F) & Sub-factors (SF)	Guiding questions
Step One: Course Selection	
F - Goal of course SF- Objectives/outcomes/competencies	Will the sub-factors be achievable in online environment?
F -Nature of course SF-Face-to-face/multi-disciplines/technology involvement or incorporation	How would the sub-factors effect teaching-learning processes in the online environment
F -Need for the course SF-Target population/faculty and students proficiency	What are the probable reactions of the sub-factors and how to accommodate their involvement in online environments

F -Content of course SF- Static/dynamic/academic level/academic rigor/course integrity	How would the sub-factors affect teaching-learning process in the online environments
F -Learner composition SF-Level/quantity/motivation/diversity	How to serve learners based on the sub-factors and would it be viable and cost effective?
F -Regulatory SF-Required/elective/occupational placement	What effect do the sub-factors have on completers of this course
Step Two: Instructional Strategies	
F - Interaction strategy SF- Mode – synchronous & asynchronous/ level/ frequency/ accessibility/ interactiveness/ learning community	What, when, where and how to increase/enhance interaction based on the listed sub-factors.
F - Support needed SF- Technical/content/ administrative/ organizational	How instructional strategy can be accomplished? What and how the listed sub-factors can do to ensure the accomplishment of the instructional strategy
F - Communication strategy SF- Media type/feedback type/ length of class	What, when, where, why and how to achieve the goal of the course based on the listed sub-factors in order to enhance communication among participants
F - Learning & Teaching resources SF- Online/ digital/ mode/electronic links	What, when, where, why and how to address the issue in the listed sub-factors in order to increase the quality of teaching and learning
F - Scope of assignments SF- Individual/group/on-going/fixed date	What, when, where, why and how teaching and learning can be accomplished effectively based on the listed sub-factors.
F - Type of course SF- Open entry-exit/fixed term	What should be emphasized and how to address the issues as listed in the sub-factors.
F - Faculty involvement SF- Frequency/depth	When, where and how faculty should be involved in the learning process to improve facilitation and class management. How and what are considered as adequate involvement?
F - Off class dialogue SF- E-mail/web site/bulletin board/streaming video etc.	When, where and how to utilize the listed sub-factors to improve teaching and learning. What and how to motivate student's participation?
Step Three: Delivery Technology	
F - Accessibility SF- Learner/remote site/ communication	How, when and where could both faculty and students get, maintain and improve access to the class. What are the appropriate measures of accessibility to be considered
F- Tools - software & hardware SF- Scalability/ availability/age/compatibility	How and what the listed sub-factors can affect the efficiency and effectiveness of the teaching-learning process
F - Support needed SF- Technical/staff/ organizational	How and what the listed sub-factors can do to ensure the effectiveness of the utilization of delivery tools to enhance teaching and learning
F- Operational cost	How delivery technology can impact cost and affect the effectiveness of learning and teaching.
Step Four: Faculty Delivery/Teaching Preferences	
F - Purpose of teaching SF- Academic rigor/ course integrity/ content determination	How to achieve and what can be done to maintain or increase the listed sub-factors

F - Faculty needs and supports SF- time/incentives/ workload/ professional development	How teaching can be facilitated and what can be done to increase faculty commitment within the "limited" supports as listed in the sub-factors. Why and what could effect faculty commitment
F - Faculty characteristics SF- Attitude/ motivation	How teaching quality and faculty commitment can be maintained or improved based on the listed sub-factors
F - Course management SF-web site/digital content/planning/feedback	Why and how the listed sub-factors could affect faculty teaching. What and how to improve faculty performance?
F - Distance learning knowledge SF- Faculty training/comfort level	Does faculty performance affected by this factor? How to determine and what can be done to increase faculty performance?
Step Five: Students' Learning Preferences	
F - Learner characteristics SF- Attitude/maturity/level/background/ motivation	What and how teaching can be facilitated to serve different characteristics of learners based on the listed sub-factors
F- Students' needs SF-Impaired/academically challenge/disadvantage/ excellent/average	What and how teaching should be administered to serve the listed sub-factors
F- Students' learning style SF-Visual/auditory/contextualized/ individualized/lock-step	How should teaching/instructions be managed and delivered to accommodate the listed sub-factors
F- Learner interest or favor SF-Auditory/visual/text/print	How to determine and what to be included or excluded in the teaching process to enhance learning based on the listed sub-factors
F- Computer skills SF-Training/self-acquisition/peer learning	How and what should be done to increase students participation in the learning that will address the issues of the sub-factors
Step Six: Technological Skills	
F - Support needed SF-Personal/infrastructure/policy	What, when, where, why and how the sub-factors can/able to do for effective teaching-learning
F - User experience SF-Teacher/students/support personal	What technological skills and knowledge are needed for effective teaching & learning, and how to improve or upgrade them?
F - Distance Learning experience SF-Prerequisite/on-going/one-shot	What, how and when this factor could be utilized and be developed, improved/upgraded to enhance teaching-learning process (class management)
F - Personal knowledge acquired SF-Technology/teaching	To what extent and how frequent this factor should be addressed to enhance teaching-learning
F - Feedback tools utilization SF-Flexible/various/fixed	Are faculty and students familiar with the delivery tools? What, when, where and how to improve/upgrade skills for effective management
Step Seven: Students' Evaluation	
F - Quality of assessment SF-Level/assignments types/accuracy/validity/reliability	What are needed, how and when to administer, and where should it be implemented to ensure the assessment address the sub-factors
F - Types/Methods of feedback SF-Test/presentation/interviews/papers/etc.	Who, what, when and where the sub-factors are relevant. How to administer effectively.

F - Accountability of assessment SF-Site coordinator or facilitator/continuous monitoring	How, where and what should be done to ensure accountability
F - Interactivity of assignment SF-Frequency/depth/maturity	To what extent the assignment should address the sub-factors, and how it can be done.
F - Format of assessment SF-Summative/formative	Should address the issue of relevancy of assessment based on context, content & time. How to do and what should be emphasized?
F - Ease of management SF-Navigation/frequency	How user-friendly the interface layout and to what extent this would help faculty/students management
Step Eight: Course/Faculty Evaluation	
F - Faculty teaching SF- face-to-face versus online/integration of modes	Address the issue of effectiveness and capability of faculty to transfer teaching skills. What, when, where, why and how to adjust?
F - Faculty/course management SF- weakness/strengths/potential/ improvement	Address the issue of transferring/transforming knowledge, skills and course content in traditional class into online environment
F - Cost-effectiveness SF - in-state/our-state students/course relevancy	Address the issue of effectiveness and benefits of the course content and management to diverse group of students.

Table 1: Steps of Utilizing the Planning Strategy

Conclusion

It is obvious from the literature that online education is still at its infancy and a sound planning is vital to the success of an online course. The current approaches of developing online courses are implemented without considering the transitional aspects that "connect" the institutional or system planning to the instructional planning. The author presented a new model for planning online courses by identifying the "missing link" through a study conducted using a Delphi technique.

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Fostering Inquiry-Based Learning Online

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Presentation Overview

Because the Web is a relatively new environment for teaching and learning, the first wave of research on distance learning has centered on the larger lessons to be learned about creating successful online courses. This paper narrows its analytical focus to a specific pedagogical approach, learning through inquiry. Using examples from three web-based distance learning courses that are part of an online Masters in Science Education program, this presentation will explore instructional design features that foster inquiry-based learning online.

What is involved in capturing the inquiry experience online?

The successful inquiry learning experience is carefully planned and focused on a clear goal, yet the process by which the lesson unfolds is collaborative, fluid, and open-ended. For this reason, each academic topic presents a unique set of challenges for course developers, faculty, and educational technologists who strive for inquiry.

These challenges have both technical and pedagogical dimensions. The process of fostering inquiry online requires re-examining old questions even while grappling with new issues:

- What does it mean to learn through inquiry? What are the central characteristics of inquiry-based learning?
- To what extent do online environments support or detract from a learner's inquiry experience? What can educators do to craft the online environment and facilitate the learning experience in such a way that course participants experience inquiry?
- How will faculty be able to tell if course participants are genuinely engaged in inquiry?

In the proposed presentation, the author will compare the design decisions made during the development of three graduate-level online courses (the introductory Try Science program course, Investigating Physics, and Biological Explorations). The author will identify common concerns and patterns of difference, present examples of original session plans, provide excerpts from formative assessment done with a pilot group of course participants, and discuss how the plans were revised in response to course participant feedback.

Project Research Sources and Methods

The paper grows out of a multi-year project to develop an online Masters in Science Education program (http://scienceonline.terc.edu). The program is a collaborative venture developed by TERC, a Cambridge-based educational non-profit organization, in conjunction with Lesley University. The project, funded by NSF and FIPSE, includes a research study of online learning conducted under the advisement of science educator Wynne Harlen.

Indicators of inquiry learning in program-sponsored courses are obtained from the following sources:

- weekly formative assessment questionnaires completed by a pilot group of course participants and submitted through an email list;
- participants' messages to colleagues and faculty in course discussion fora;
- participant course work, including investigation reports, write-ups of clinical interviews with children, and investigations developed by participants;
- course participant email correspondence with faculty; and
- post-course face-to-face interviews with course participants.

Preliminary Conclusions

While the process of fostering inquiry in an online learning environment bears some resemblance to the inquiry process in face-to-face settings, there are notable differences that must be considered if the course is to achieve its pedagogical goals. Because verbal cues and opportunities for on-the-spot clarification are largely absent in online learning, educators need to ensure that all communication and assignments are congruent with the inquiry approach.

To craft online experiences that set the stage for successful inquiry, developers and educational technologists also need to identify the inquiry challenges and opportunities that are unique to the subject matter. For example, a challenge in investigating the physics of motion is to gather data and discern patterns in motions that last only a few seconds. In contrast, a challenge inherent to biological investigation is tracking growth and making meaning of processes that unfold over the course of days or weeks.

The learning context also needs to be situated in inquiry – it must be a place where participants experience the power of prediction, firsthand observation, and generating theories out of evidence. This requires an attention to detail, writing tone, timing of messages, and assignment structure that is unfamiliar to most classroom educators.

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An Online Solution to Educational Technology Leadership Certification: A Case Study

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Abstract: As schools continue to invest heavily in technology, more trained technology leaders are needed to manage the use of it and prepare teachers to integrate technology in the classroom. To address this the State of Louisiana has created a new certification for technology facilitators. Three universities collaborated to develop seven courses for online delivery that assist teachers seeking certification as building-level or district-level technology managers. This study attempts to present a case study on a collaborative effort to design and evaluate online courses that apply to state technology certification.

Introduction

The need in K-12 schools for technology leaders, planners, trainers and managers continues to grow across the country. To address the need, state certification offices are changing procedures for certification of educational technology personnel to accommodate changes in certification requirements but driven by pressures to redo certification requirements that are out of date or inappropriate for 21-century schools. Louisiana is no different. As a result of changes in technology certification by the Board of Elementary and Secondary Education in Louisiana a variety of new courses were needed to prepare teachers to become building level technology facilitators or key educational technology leadership coordinators, directors or specialists. Taking into account the large and continued investment in technology K-12 education, adding to the mix initiatives from the Governor's Blue Ribbon Commission's Technology Consortium for Teacher Education in collaboration with the State Department of Education's Louisiana Center for Educational Technology, and recommendations from the Board of Regents for new certification guidelines to encourage emergence of new leaders in technology, certification guidelines were changed. To accomplish such an imposing task institutions must collaborate with others to develop curriculum appropriate for new certification guidelines and train faculty to serve as online developers for classes that support certification. Furthermore, limited resources at colleges and universities mandate collaboration

between institutions not only because it demonstrates sound practice but, out of necessity, is influenced by dwindling budgets. Courses offered online toward technology certification require a substantial investment in resources and faculty. Yet they offer a solution that is practical and accommodating to those who seek certification as building-level or district-level technology managers.

The Need For Certification

School districts across the country continue to spend additional funds and dedicate resources for educational technology. The State of Louisiana is doing the same in a concerted effort to reduce the ratio of computers in the classroom to at least 5:1 by the year 2004 (Louisiana Center for Educational Technology, 2001). The State Department of Education in Louisiana has a number of programs that support the use and training of teachers for technology integration. The Louisiana Center for Educational Technology assumes the leadership role in overseeing these technology programs which include InTech, InTech2 Science, LEADTech, FIRSTTech, regional technology centers, and Teach Louisiana (State Department of Education). "Taking into account the huge investment in technology for K-12 and higher education and the urgent need for leaders who are prepared to address the myriad of issues surrounding integration of technology in our educational system, it is critical that we take steps to expand the pool of qualified technology leaders" (Technology Consortium for Teacher Education , 2001, p.1). The certification of technology facilitators at the school and district levels addresses a primary goal in the state technology plan; all teachers will receive technology support from a certified technology facilitator. Certified facilitators will also assist teachers in achieving technology competency (Louisiana Technology Plan).

The Certification Program

The design of the certification process was a result of a study by educators to determine what was needed to improve the skills of technology facilitators and to address standards developed by ISTE (International Society for Technology in Education) called ECT (Educational Computing and Technology) Standards. This new certification process satisfies not only ISTE but also NCATE (National Council for Accreditation of Teacher Education) standards that are at the core of teacher education reform. Louisiana's two new certifications for building and district level facilitators are based upon two ISTE ECT standards, Educational Computing and Technology Facilitation Standards (ISTE, 2001a) and Educational Computing and Technology Leadership Standards (ISTE, 2001b).

Certification for technology coordinators includes two areas, building-level and district level. The certification in Educational Technology Facilitation prepares building-level technology facilitators to provide professional development and resource materials for technology integration, and solve routine technical problems for teachers at their schools (Technology Consortium for Teacher Education, 2001). The second certification, Educational Technology Leadership, addresses the need for leaders to serve as technology coordinators at the district, state or regional levels. "These professionals focus on the overall planning acquisition, administration, management, and professional development for their district, regional, or state responsibilities" (Technology Consortium for Teacher Education, p. 3).

Design and Implementation of the Online Certification Program

Technology certification is typically offered at colleges and universities either as an "add-on" option or folded into a degree plan such as an M.Ed. These certification procedures take years to complete especially when those seeking certification cannot attend classes regularly on campuses that offer certification courses or degrees. An online solution is available in Louisiana as a result of collaboration between three institutions in Louisiana who designed and built courses that comply with Louisiana technology certification requirements. The Board of Regents in Louisiana proffers a program to support the development of online courses and initiatives, the Louisiana Educational Technology Facilitation and Leadership Program. This program is a grant source to provide funding for initiatives that promote online instruction in higher education.

In the wake of the online certification initiative, new courses were needed to comply with the updated certification requirements rendering old technology courses useless for application to technology certification. Recognizing that a mechanism was needed to build courses appropriate for the new

certification requirements, a group of three institutions--Northwestern State University, the University of Louisiana at Lafayette and Nicholls State University--collaborated on a project to redesign, field test and

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Establish a links/resources forum on Blackboard	Post Internet based references to support development of the course	Review Internet resources for relevancy to online class
Establish a syllabus forum on Blackboard	Discuss the organization of the syllabus and post rough drafts for discussion	Review the rough syllabi and produce the final with development team
Establish a comments/questions forum on Blackboard	Address questions and comments by all team members	Provide suggestions, answers, recommendations from instructional designer or team member with experience or expertise related to the issue
Produce online course	Post components for discussion by team members	Review components and modify
Establish an evaluation plan for online courses developed	Evaluate the course by submitting reports from the development team leader who usually was the first to teach the new online certification course	Internal evaluation by development team leader
Evaluation continued	External evaluator reviews data from student surveys and examines the course looking at instructional design, syllabus, and activities	Review based upon Technology Consortium for Teacher Education and ISTE standards

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Technology Leadership. A grant was written to the Board of Regents Distance Education Initiative, Louisiana Educational Technology Facilitation as the primary funding source with the impetus to include three institutions in a collaborative effort to create courses that apply to educational technology certification through the Department of Education. In addition, Northwestern State University would use these classes for the core of a Masters in Education with an Emphasis in Educational Technology online. This degree was already available but did not align itself with new state certification guidelines. The design of the project proposed that seven online courses be developed, fulfilling the new requirements for certification in Educational Technology Facilitation and Educational Technology Leadership recently approved by the Board of Elementary and Secondary Education. A survey revealed that over 300 people would be interested in pursing the proposed certifications. Furthermore, superintendents, technology supervisors, school site administrators, and teachers had been interviewed to assess potential need for certified technology personnel.

The project was divided into three phases: design including faculty training, course development and evaluation of online courses. Moreover it was a model of collaboration between three universities that demonstrated the need to share resources between and within institutions. Seven courses were proposed for development for online distribution at Northwestern State University, University of Louisiana at Lafayette, and Nicholls State University--all institutions under the University of Louisiana System. The original grant was designed as a two-year process to include training of College of Education faculty who were new to electronic learning in the design and delivery of online courses. It also included development of a shared M.Ed. with a technology emphasis that meets state certification requirements. Other components of the grant called for designing and evaluating seven online courses; defining, developing and institutionalizing faculty support for distance delivery; and developing a model for online student support for courses taught at a distance. These included the obvious such as financial aid, advising, administration, student services, business affairs, library and bookstore.

The operating system and web-based software is Blackboard which is used for creating online classes, collaboration and evaluation. Northwestern State University was the host institution for the project. Most online classes included a development team of three to four faculty per course. The development team used Blackboard as a forum for course developers. Course descriptions, objectives and criteria were posted by faculty for discussion with each team. One participating team member served as the lead developer. An instructional designer coordinated the project and established the parameters for collaboration in course development. Several electronic forums, created on Blackboard, accommodated the planning and development of online courses for certification. First, a forum was created to introduce the course developers on a team to each other and to other members of the project. Second, a course Description/ Outcomes forum was established for faculty to post course descriptions and elaborate their vision of the online course. Standards-based course descriptions from the Technology Consortium for Teacher Education and ISTE were posted. They were provided for faculty to review as they developed their course descriptions and objectives. A third forum was posted for Assignments/Activities. To support this a "Lecture" forum was created to allow developers to post and share pieces of content relevant to the courses. Fifth, a Links/Resources forum was created to post Internet references for the online class. A syllabus forum was posted for faculty to discuss the components of an appropriate syllabus for online certification courses. To address questions and comments from team members regarding other forums, a discussion forum for Questions/Comments was created. The target date to complete course development was Spring 2001 with implementation, RE: teaching courses already developed to follow in the summer and fall. Three (Technology Leadership in Schools, Technology Planning and Administration, and Advanced Telecommunications and Distance Learning) of the seven were completed and piloted during the summer at Northwestern State University. The remaining courses were completed in the summer of 2001 and offered in the fall by respective campuses. Nicholls State University offered Educational Telecommunications Networks and the Internet, Technology Leaderships in Schools and Professional Development for K-12 Technology Integration. The University of Louisiana at Lafayette added Design and Development of Multimedia Instructional Units and Technology Leadership in Schools.

Evaluation of Online Classes

There was a two-stage process for evaluation. The first was an internal evaluation performed at each campus by each primary investigator as designated from the grant. The PIs provided reports about student participation in the online classes including the number of logins. An external evaluator will provide the second stage of evaluation. This evaluator will provide and analyze data from student surveys

to determine student satisfaction in the online course and other affective data. The external evaluator will also review components of the courses such as the syllabus, activities and assignments to insure they correspond to standards established by ISTE. The evaluator will also examine the instructional design of the course to see if it is appropriate for online delivery.

Inherent Problems With Online Classes Developed For Technology Certification

The development of these courses was a collaborative effort, which proved challenging to say the least. Communication between participants was limited as evidenced from postings and exchange on Blackboard. While some faculty were less than comfortable with this procedure, especially those that had never taught online before, they benefited greatly from the exchange and opportunity to use software for online instruction. Some course developers took liberty with their course objectives and how they compared to ISTE standards. Some teams represented from different camp uses had an array of opinions as to course content for certain courses. Some wanted to take a theoretical approach to satisfy course objectives; others promoted a practical approach. Under the category of "lessons learned," a longer timeline was needed to design and produce online classes; at least from one to two semesters. Regular progress reports from participants would have better served the grant. In addition, the faculty who had never taught online had a larger learning curve to overcome, as they were uncomfortable communicating with team members online and could not "envision" what differences are inherent between online and face-to-face instruction. Finally, the faculty had too many "irons in the fire" to dedicate adequate time to online course development not uncommon with faculty who volunteer for projects like this.

Conclusion

In an attempt to provide an online solution to deliver technology certification in Educational Facilitation and Leadership a grant was secured by three institutions for development, implementation and evaluation of seven online courses. In retrospect the project was not without problems and delays. But, the work was completed and the classes tested by the toughest critics of all, online students. What resulted is a cadre of courses for technology certification that are now offered intoto at participating universities. A by-product of this project was a model of collaboration between three institutions with a common goal: design, implement and evaluate online courses that apply toward state technology certification. Furthermore, the effort provides credence to the notion that successful online classes must be properly designed, defined, evaluated, institutionalized to garner support for faculty to deliver courses at a distance, and modeled to include online student support, issues that continue to challenge distance learning initiatives.

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An Online Solution to Educational Technology Leadership Certification: A Case Study

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The need in K-12 schools for technology leaders, planners, trainers and managers continues to grow across the country. To address the need, state certification offices are changing procedures for certification of educational technology personnel to accommodate changes in certification requirements but driven by pressures to redo certification requirements that are out of date or inappropriate for 21-century schools. Louisiana is no different. As a result of changes in technology certification by the Board of Elementary and Secondary Education in Louisiana a variety of new courses were needed to prepare teachers to become building level technology facilitators or key educational technology leadership coordinators, directors or specialists. Taking into account the large and continued investment in technology K-12 education, adding to the mix initiatives from the Governor's Blue Ribbon Commission's Technology Consortium for Teacher Education in collaboration with the State Department of Education's Louisiana Center for Educational Technology, and recommendations from the Board of Regents for new certification guidelines to encourage that new leaders in technology emerge, certification guidelines were changed. This new certification process satisfies ISTE (International Society for Technology in Education) and NCATE (National Council for Accreditation of Teacher Education) standards which are at the core of teacher education reform. In the wake of the initiative, new courses were needed to comply with the updated certification requirements rendering old technology courses useless for application to technology certification.

Recognizing that a mechanism was needed to build courses appropriate to the new certification requirements a group of three institutions, Northwestern State University, the University of Louisiana at Lafayette and Nicholls State University collaborated on a project to redesign, field test and model new classes to be taught online that equal or exceed all State Department of Education certification requirements for certification as a building level technology facilitator or staff designee in Educational Technology Leadership. A grant was written to the Board of Regents Distance Education Initiative, "Louisiana Educational Technology Facilitation" as the primary funding source with the impetus to include three institutions in a collaborative effort to create courses that apply to educational technology certification through the Department of Education. In addition, Northwestern State University would use these classes for the core of a Masters in Education with an Emphasis in Educational Technology online. This degree was already available but did not align itself with new state certification guidelines. The design of the project proposed that seven online courses be developed, fulfilling the new requirements for certification in Educational Technology Facilitation and Educational Technology Leadership recently approved by the Board of Elementary and Secondary Education. A survey revealed that over 300 people would be interested in pursing the proposed certifications. Furthermore, superintendents, technology supervisors, school site administrators, and teachers had been interviewed to assess potential need for certified technology personnel.

The original grant was proposed as a two-year process to include training of College of Education faculty who were new to electronic learning in the design and delivery of online courses. It also included development of a shared M.Ed. emphasis meeting state certification requirements. Other components of the grant called for designing and evaluating seven online courses; defining, developing and institutionalizing faculty support for distance delivery; and developing a model for online student support for courses taught at a distance. These included the obvious such as financial aid, advising, administration, student services, business affairs, library and bookstore.

The development of these courses was a collaborative effort, which proved challenging but successful as evidenced by the courses produced by the participating institutions. Communication with participants resulted from postings and exchange on Blackboard, online software currently used at Northwestern State University. While some faculty were less than comfortable with this procedure, especially those that had never taught online before, they benefited greatly from the exchange and opportunity to use software for online instruction. Under the category of "lessons learned," a longer timeline was needed to design and produce online classes; at least from one to two semesters. Regular progress reports from participants would have better served the grant.

The purpose of the paper is to present a case study on a collaborative effort between three institutions to design and evaluate online courses that apply to state technology certification. Moreover, the paper will attempt to provide credence to the notion that successful online classes must be properly designed, defined, evaluated, institutionalized

to garner support for faculty to deliver courses at a distance and modeled to include online student support, issues that continue to challenge distance learning initiatives.

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Abstract: As schools continue to invest heavily in technology, more trained technology leaders are needed to manage the use of it and prepare teachers to integrate technology in the classroom. To address this the State of Louisiana has created a new certification for technology facilitators. Three universities collaborated to develop seven courses for online delivery that assist teachers seeking certification as building-level or district-level technology managers. This study attempts to present a case study on a collaborative effort to design and evaluate online courses that apply to state technology certification.

Introduction

The need in K-12 schools for technology leaders, planners, trainers and managers continues to grow across the country. To address the need, state certification offices are changing procedures for certification of educational technology personnel to accommodate changes in certification requirements but driven by pressures to redo certification requirements that are out of date or inappropriate for 21-century schools. Louisiana is no different. As a result of changes in technology certification by the Board of Elementary and Secondary Education in Louisiana a variety of new courses were needed to prepare teachers to become building level technology facilitators or key educational technology leadership coordinators, directors or specialists. Taking into account the large and continued investment in technology K-12 education, adding to the mix initiatives from the Governor's Blue Ribbon Commission's Technology Consortium for Teacher Education in collaboration with the State Department of Education's Louisiana Center for Educational Technology, and recommendations from the Board of Regents for new certification guidelines to encourage emergence of new leaders in technology, certification guidelines were changed. To accomplish such an imposing task institutions must collaborate with others to develop curriculum appropriate for new certification guidelines and train faculty to serve as online developers for classes that support certification. Furthermore, limited resources at colleges and universities mandate collaboration

between institutions not only because it demonstrates sound practice but, out of necessity, is influenced by dwindling budgets. Courses offered online toward technology certification require a substantial investment in resources and faculty. Yet they offer a solution that is practical and accommodating to those who seek certification as building-level or district-level technology managers.

The Need For Certification

School districts across the country continue to spend additional funds and dedicate resources for educational technology. The State of Louisiana is doing the same in a concerted effort to reduce the ratio of computers in the classroom to at least 5:1 by the year 2004 (Louisiana Center for Educational Technology, 2001). The State Department of Education in Louisiana has a number of programs that support the use and training of teachers for technology integration. The Louisiana Center for Educational Technology assumes the leadership role in overseeing these technology programs which include InTech, InTech2 Science, LEADTech, FIRSTTech, regional technology centers, and Teach Louisiana (State Department of Education). "Taking into account the huge investment in technology for K-12 and higher education and the urgent need for leaders who are prepared to address the myriad of issues surrounding integration of technology in our educational system, it is critical that we take steps to expand the pool of qualified technology leaders" (Technology Consortium for Teacher Education , 2001, p.1). The certification of technology facilitators at the school and district levels addresses a primary goal in the state technology plan; all teachers will receive technology support from a certified technology facilitator. Certified facilitators will also assist teachers in achieving technology competency (Louisiana Technology Plan).

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The design of the certification process was a result of a study by educators to determine what was needed to improve the skills of technology facilitators and to address standards developed by ISTE (International Society for Technology in Education) called ECT (Educational Computing and Technology) Standards. This new certification process satisfies not only ISTE but also NCATE (National Council for Accreditation of Teacher Education) standards that are at the core of teacher education reform. Louisiana's two new certifications for building and district level facilitators are based upon two ISTE ECT standards, Educational Computing and Technology Facilitation Standards (ISTE, 2001a) and Educational Computing and Technology Leadership Standards (ISTE, 2001b).

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Inherent Problems With Online Classes Developed For Technology Certification

The development of these courses was a collaborative effort, which proved challenging to say the least. Communication between participants was limited as evidenced from postings and exchange on Blackboard. While some faculty were less than comfortable with this procedure, especially those that had never taught online before, they benefited greatly from the exchange and opportunity to use software for online instruction. Some course developers took liberty with their course objectives and how they compared to ISTE standards. Some teams represented from different camp uses had an array of opinions as to course content for certain courses. Some wanted to take a theoretical approach to satisfy course objectives; others promoted a practical approach. Under the category of "lessons learned," a longer timeline was needed to design and produce online classes; at least from one to two semesters. Regular progress reports from participants would have better served the grant. In addition, the faculty who had never taught online had a larger learning curve to overcome, as they were uncomfortable communicating with team members online and could not "envision" what differences are inherent between online and face-to-face instruction. Finally, the faculty had too many "irons in the fire" to dedicate adequate time to online course development not uncommon with faculty who volunteer for projects like this.

Conclusion

In an attempt to provide an online solution to deliver technology certification in Educational Facilitation and Leadership a grant was secured by three institutions for development, implementation and evaluation of seven online courses. In retrospect the project was not without problems and delays. But, the work was completed and the classes tested by the toughest critics of all, online students. What resulted is a cadre of courses for technology certification that are now offered intoto at participating universities. A by-product of this project was a model of collaboration between three institutions with a common goal: design, implement and evaluate online courses that apply toward state technology certification. Furthermore, the effort provides credence to the notion that successful online classes must be properly designed, defined, evaluated, institutionalized to garner support for faculty to deliver courses at a distance, and modeled to include online student support, issues that continue to challenge distance learning initiatives.

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Learning in Online and Desktop Video Conferencing Courses: Are Some Students Plugged In and Tuned Out?

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Abstract: According to research conducted in two studies examining incidental learning activity within a complex of asynchronous online courses and compressed desktop video courses at a mid-sized university, incidental learning outcomes not identified as part of the formal curriculum are evident. Learning to use technology and individual and group attitudes and behavioral patterns are two particular outcomes. The results of both studies illustrate the importance of incidental learning and of developing a learning environment that fosters positive outcomes. Theory and application concerning teaching and learning in online distance education courses and desktop video conferencing courses may differ. This paper compares and contrasts current online and DVC learning theory with observations and reflections of the researchers that show what may actually be happening with some students in today's distance education classrooms.

Introduction

A dichotomy may exist between theory and application concerning teaching and learning in online distance education courses and desktop video conferencing courses. According to research conducted in two studies examining incidental learning activity within a complex of asynchronous online courses and desktop video conferencing courses (DVC) at a mid-sized university (Furr 2000, McFerrin 1998), incidental learning outcomes not identified as part of the formal curriculum are evident. Learning to use technology and individual and group attitudes and behavioral patterns are two particular outcomes. The results of both studies illustrate the importance of incidental learning and of developing a learning environment that fosters positive outcomes.

Actual student observations uncovered specific student behaviors that produced a less than desirable classroom environment. Technology problems and lack of sufficient class interaction and participation cause students to become distracted from focusing on course content. While frustration levels in students in the DVC courses are higher than those in the online courses, elements of frustration exist in both. A comparison and contrast of current online and DVC learning theory with observations and reflections of the researchers show what may actually be happening with some students in today's distance education classrooms (Furr 2000, Hara & Kling 2000, Johnston 2000, Robertson 2000, Collins 1999, McFerrin 1998).

Asynchronous Online

The first study, titled "Incidental Learning in a Higher Education Asynchronous Online Distance Education Course" (McFerrin 1998), was designed to examine and describe the incidental learning activity of students in an asynchronous online course in a higher education setting. While literature concerning student performance and experiences in higher education online courses is available (Everett 1999, Neal 1997, Hites & Ewing 1996, Thomerson & Smith 1996, Jegede & Kirkwood 1994), little has been researched concerning incidental, or collateral, learning at the higher education

level (Ragsdale 1997, Mealman 1993). McFerrin's research was conducted with data collected from interviews, journals, observations, email messages, and online conferencing software postings of 22 members of three sections of a graduate-level asynchronous online distance education course at a mid-sized four-year university in the spring of 1998. Each graduate student was interviewed at the beginning of the semester and at the end of the semester. A late-semester questionnaire was sent to all participants. All email and conference postings were analyzed. Each was asked to keep a journal throughout the semester.

Two types of incidental learning outcomes occurred. The first developed from the students' learning to use the technology itself. Accessing the Internet, developing search skills, working within an online course, and using conferencing software were teamed with an increase in researching, writing, and word processing skills. The second type of incidental learning outcome centered on an improvement in certain areas of the students' personal development. An increase in time management ability, self-directive behavior, self-confidence, and self-discipline occurred. Students in the online course exhibited an increase in self-knowledge and a belief that more new goals can be set and successfully accomplished. All students obtained unplanned and unanticipated learning outcomes not identified as part of the formal curriculum.

The results of the study illustrated the importance of incidental learning in an asynchronous online course. When developing coursework for graduate students in a life-long learning field such as education, faculty and administrators must seek to develop a climate in which incidental learning is likely to occur. Both students and instructors must see the value of incidental learning to the student and must foster its development.

Desktop Video Conferencing

The second study, "The Occurrence of Incidental Learning in Higher Education Desktop Video Conferencing Classes: An Ethnographic Study" (Furr 2000), addressed learning in desktop video conferencing (DVC) courses, a relatively new delivery medium for college courses. This study examined the incidental learning within a complex of compressed desktop video courses at a mid-sized university. Although ample literature covers incorporating technology into the classroom (Russell 2000, Saba 1998, Moore & Kearsley 1996, Cuban 1986), little documents the experiences and perceptions of students and faculty in distance education courses (Johnston 2000, Jegede et al. 1999, McKee 1999, Biner & Dean 1997). Because DVC is a new technology, even less literature targets its effects on teaching and learning environments (Cifuentes et al. 1999, Merisotis & Phipps 1999, Thorpe 1998, Mize 1996).

The DVC study was structured to replicate McFerrin's 1998 examination of incidental learning in asynchronous, on-line college instruction. The researcher employed grounded theory to examine the experiences and perceptions of participants--faculty, students, and staff--in five desktop video conferencing courses offered spring 2000 through a synchronous audio and video delivery system that allowed students in eight rural sites to complete education courses. The researcher triangulated data from field observations, interviews, surveys, participants' journals, and course materials. Quantitative measures of participant satisfaction and content analysis of journals and course documents also were used.

Consistent with McFerrin's findings, the researcher discovered two types of incidental learning outcomes not identified as part of the formal curriculum: learning to use technology and individual and group attitudes and behavioral patterns. Factors that afforded positive experiences and perceptions were convenience and reduced driving time, informal class atmosphere, small classes, prior computer skills, access to a computer and the Internet, internal student traits, and instructor facility with technology and distance education pedagogy. Factors that diminished a positive experience were technical problems, insufficient administrative support, inadequate training, weak proctor system, and negative student behaviors.

Unlike McFerrin's study, Furr (2000) found a higher level of frustration among participants in the DVC courses. Of the 52 students polled at the semester's end, 48% said they would take another DVC course, 17% said "no," and 21% said the type of course offered would determine their decision. The remaining percentage of students either did not answer the question or said they were graduating. Of those willing to take another DVC course, convenience was the top-cited reason. They were also willing to forgive technical problems, believing "bugs would be fixed." Nonetheless, a sizable number of students reported either a negative or neutral stance regarding DVC.

> One graduate student commented: Today's class was very frustrating - just like all the other times. We could hardly hear [instructor x] and were having the usual technical difficulties. We only covered [one topic], and I was still confused after we finished it. I had typed a question in the chat box, but [instructor x] never saw it so it never got answered. And it takes forever to just get the class started. It seems like by the time we get everybody logged in and settled, the class is almost half over.

An undergraduate student said: Once they work the kinks out, it will be a great program, but I think the program is better suited for rural sites and better for nontraditional students. It's not so great for your typical undergraduate. I don't have any interaction with the teacher. Normally, you could see the teacher before or after class.

Faculty, students, and proctors shared with the researcher their frustration at the negative student behaviors that festered during the semester. One proctor, also a DVC student, said she had learned adults do not always behave like adults and that once instructors lost control of their classes, "they've lost it all." She said many students were frustrated with initial and ongoing technology problems and never got past the frustration, which they vented aloud in class. "It became ongoing and public and diminished a professor's authority and respect," one proctor said.

The researcher observed many students coming to and leaving classes at will, napping, surfing the Internet, playing games on the computer, sending and receiving e-mail, completing homework for other courses, calling on cell phones, inserting music CD's to listen to during class, badmouthing instructors, carrying on conversations totally unrelated to the course, and generally being completely off-track. One instructor noted that the array of technology available to students during class and the added focus and concentration needed for instructors to deliver a course and for students to process the content prompted students to go "mentally off-line."

The DVC study's results illustrated the importance of incidental learning in a desktop video conferencing course and of developing a learning environment that fosters positive outcomes. If a positive outcome is to occur, then DVC requires substantial technical training and support, administrative support for faculty, and a strong proctor system. Importantly, educators must continue to refine the pedagogy of effective teaching and learning with DVC. It is not an intuitively easy system to operate while simultaneously delivering course content, promoting student participation, managing student behavior, and troubleshooting technical problems.

As with any program, ongoing local evaluative studies that monitor participants' experiences and perceptions are critical if a DVC's program is to succeed, improve, and be sustained. Erhmann (1998) defined the technology of a program as its "hardware, software, and social technology" (p. 2). He emphasized the importance of knowing "what is happening right here, right now, this year, with these people" (p. 3). Fulk, Schmitz, and Steinfield (1990) constructed a Social Influence Model of technology use that considered influences such as work group norms and co-worker and supervisor attitudes and behaviors that positively or negatively influence attitudes, media use, and choices. Fulk (1993) proposed that an organization's members could be expected to develop coordinated patterns of behavior based on observations of each other's behaviors, the consequences of behaviors, and emotional reactions. Detecting those patterns, whether faculty, student, or staff, is crucial to avoid falling into the trap of the "rapture of technology" and failing to assess how different learners use technology differently with different and sometimes unexpected results (Ehrmann 1998).

Similarities and Differences

The two studies highlighted similarities that existed between these particular asynchronous online and synchronous DVC courses, including the:

1. Need for students to be self-disciplined, self-motivated, and patient
2. Variance in computer skills and technology accessibility that existed among the students
3. Use of email for communication between student and instructor
4. Compulsiveness of students
5. Unrealistic expectations of students
6. Lingering technology frustration
7. Vulnerability of at risk students
8. Lack of driving time and expense devoted to travel
9. Newness and niftiness of the technology
10. Expense to operate courses successfully
11. Smaller size of the classes
12. Lack of University-wide system for student evaluation

Key differences noted between asynchronous online and synchronous DVC courses included the following:

1. In a text-based online course, students tend to be more careful in their comments about other students, the course, and the instructor. In a DVC course students at remote sites can informally converse among themselves, with negative behaviors and comments often going unchecked. A strong proctor system, particularly with younger or more immature students, is key for DVC.

2. In a DVC course, negative individual attitudes and behaviors can affect an entire group, with an instructor unable to monitor individual and group behaviors simultaneously. Classroom management issues and strategies become accentuated in DVC courses.
3. In an asynchronous course, students understand the "transactional distance" between themselves and the instructor and do not expect immediate, real-time feedback. A DVC course gives students the illusion of one-to-one contact with the instructor and active participation. When a student's electronic raised hand or comment in the chat box goes unnoticed or unacknowledged for even a brief time, students tend more easily to disengage from class.
4. Students in online classes are accustomed to and expect a primarily text-based system, whereas the camera and monitor in a DVC class prompt in students a "TV" attitude. However, current DVC technology with its small video window and jerky transmission often relegates faculty and other students to tiny, out-of-focus talking heads. Boredom and disengagement again can result if students are not themselves focused, motivated, and disciplined.
5. A DVC system requires more technical support during class for both the instructor and students at remote sites. While an online class can weather downtime, a DVC course cannot. A DVC course requires more faculty technical training and preparation for technical contingencies.
6. In an online course, students can choose the time, pace, and duration of their course interaction. In a DVC course, the hours are set just as in a traditional course. Being tethered to a computer for two to three hours and staring at a computer screen can be physically tiring and boring, conditions ripe for frustration and disengagement. For DVC courses, changing activities and frequent breaks are key.

Conclusion

The two studies highlighted the differences and similarities in learning and teaching environments fostered by the two different delivery systems. Both researchers have years of experience as students, educators, developers, and researchers of distance education courses Although "good teaching" has many universal tenets, the notion that faculty or students can seamlessly transfer from the traditional classroom to varied electronic formats should be dispelled. These findings underscore the importance of specific faculty development, curriculum planning, and administrative support for distinct electronic venues.

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Tennessee Board of Regents - Regents Online Degree Programs

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Tennessee Board of Regents' colleges, universities, and technology centers joined in Fall 2001, to offer the **Regents Online Degree Programs (RODP).** All the institutions are fully accredited. All thirteen TBR two-year colleges deliver and award the noted associate degrees, while all six TBR universities deliver and award the noted bachelor degrees. Courses completed in the Regents Online Degree Programs are entirely online and transferable among all the participating institutions. Students are able to choose the college or university (home school) for their admission, registration, and the award of their degree.

The degrees offered are:

- Associate of Applied Science in Professional Studies: Concentration in Information Technology
- Associate of Arts in General Studies (University Parallel)
- Associate of Science in General Studies (University Parallel)
- Bachelor of Professional Studies with concentrations in Information Technology or Organizational Leadership
- Bachelor of Interdisciplinary Studies (General Studies/Liberal Studies/University Studies)
- Masters in Education (in development for Fall 2002)
- Certificate in Computers Operations Technology (TN. Technology Centers Fall 2002)

The Regents Online Faculty and Staff have been highly trained in teaching, learning, and assessing the needs of online students. The Regents Online Courses are designed for a 12 week semester--in an interactive, asynchronous (accessing courses at your convenience) format. These courses contain the same content and rigor as courses on campus. Student Services such as advising, library services, student support, and other forms of student assistance are offered for online delivery. Technical support for accessing course lessons and assignments are available 24 hours 7 days per week.

Vision: "A better life for Tennesseans through education"

Mission: "The Regents Online Degree Programs, using technology, will improve access to high quality, affordable, student-centered learning opportunities through cooperation among TBR institutions."

Goals:

To increase access to higher education for adult Tennesseans, especially those with some college experience. Census data document that Tennesseans lag behind both the national and regional averages of educational attainment. Further, attainment is uneven across the state, with rural areas lagging far behind urban areas. Economic development of the state depends on increasing the skill levels of the population.

To maximize the effective use of technology for delivery of college-level instruction. Distance delivery through the use of technology will increase access to higher education, especially in remote areas of the state and for adult learners for whom time flexibility is a critical resource.

To provide student access to web-based courses and degree programs. Web-based courses will reach populations not currently enrolled in higher education, and will also permit students who are currently enrolled in on-campus courses to take additional courses, thus completing their programs sooner.

Partnership with Eduprise E-learning Corporation

Eduprise, the leading provider of enterprise e-Learning services for education institutions and businesses, partnered with Eduprise to provide strategic planning, infrastructure hosting support and instructional development services. Eduprise established a major role in TBR's bold initiative by providing the infrastructure support services to underpin the strategic plan for the Regents' web-based degrees. These services include a hosted WebCT course management system, 24x7 technical help desk for students and instructors, WebCT software training for instructors, instructional design assistance.

Current Success

It was projected that the Fall 2001 enrollment would total to 300. However, the final enrollment number was 1,954 with a withdrawal rate of less than 12% and a dropout rate of less than 20% compared to the national average of 42%.
The student and faculty surveys indicated an overall satisfaction rate of 79%.
The early Spring 2002 registration (conducted in Nov. 2001) ended at 2,732 enrollments, far exceeding, the Fall 2001 numbers.
(This proposal is being submitted before Spring Final Registration)
Final registration will convene on January 7th, 2002. It is predicted that all courses will be closed due to full enrollment. If this proposal is accepted, the participants will receive data regarding the program, student, and faculty evaluations, Spring registration figures, average retention rate, and new degree programs.

Sexual Harassment Training Online: Incorporating Layout, Design, and Pedagogy

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Password: eiu37

(This version is online for testing purposes and future modifications will include using streaming as opposed to embedded audio.)

Abstract: In order to provide a better working and learning environment, and to comply with state and federal law, Eastern Illinois University requires new employees to complete a sexual harassment training session within their first six months of employment. Because of scheduling conflicts or demands, this seminar is now being offered online. There are many challenges in developing this type of online course and special care must be taken to create the most interactive, informative, and user-friendly version possible. An effective course design will encourage and facilitate active user participation and will incorporate animation, audio, and other multimedia elements that enrich the learning process.

The focus of this paper describes how this course was developed and details design and pedagogical techniques educators can use to enhance their online seminar materials.

Introduction

The decision to offer sexual harassment training online should not be arrived at lightly. Face to face seminars still have the advantage when it comes to audience participation and interaction. Question and answer sessions provide valuable opportunities for members to get immediate answers to their questions. Advocates of online learning point out that while the technology itself is important, effective learning methodologies are crucial for a site to be successful (Turoff, 1999). Additionally, authors of online sexual harassment courses must be able to draw from experience and expertise in order to come as close as possible to recreating the live seminar in an online format. There is a wealth of information available on the net regarding sexual harassment. Therefore, users of your online seminar must feel that there is some type of extra value, or ease of use associated with your site in order for them to "buy in" to the concept and ultimately absorb the information. It is also important to remember that at least some users will not be at the site by choice, which will make them even more prone to distraction.

Site Design

Designing this site was the author's first attempt at Web design. Macromedia Dreamweaver 4 was used along with Macromedia Fireworks 4 and Coursebuilder. Dreamweaver permits the user to design a site without knowing a single line of code and Fireworks (www.macromedia.com/software/fireworks/) makes it possible to animate and customize text and images. Coursebuilder, which can be downloaded for free from the Macromedia site, was extremely useful in making the site interactive.

Dreamweaver (www.macromedia.com/software/dreamweaver/) is a very user-friendly software package that comes with a how-to reference book along with movie tutorials and links to helpful websites. However, designing the first page still took approximately 10 hours. Successive pages were added more quickly. The use of templates is advised as this will streamline the design of the site and will provide uniformity. Integrating substantive content into the site was started two weeks after the project began.

Coursebuilder was used extensively in the site in order to get the user involved. This application makes it very east to incorporate questions and answers throughout the course. Formats range from multiple choice and true/false questions to drag and drop interactions. Additionally, the software will track and record test answers and send them to a central location. Inserting a Cousebuilder interaction is easy and can be done with just a few clicks. Typing the question and answer choices can be done either in the Coursebuilder folder or on the Dreamweaver work page.

Site Layout

Appropriate color schemes, graphics, and animations are essential in creating a successful site. However, artistic design is not the primary purpose of a Web page. The substantive content should not be overwhelmed by excessive graphics and colors. Additionally, buttons and other navigation devices should allow the user to move easily from one area to another (Bohannon, 2001). Animating text can also make the site come alive which serves to keep the attention of the user. However, excessive use can be distracting.

The use of audio is another consideration when designing this type of site. Audio files can be distributed by either streaming audio or file downloading (Gerth, 2001). For longer audio files, streaming audio works better because it allows small portions of the file to be delivered and then play while the rest of the file is downloaded just ahead of the playback portion. For smaller audio files, it may be easier to just download the file to the user's hard disk before playback begins. Because people retain only 20% of what they hear, and 30% of what they see, but 50% of what they see and hear, integrating audio to enhance learning is very useful (Gerth, 2001).

Pedagogy

As stated earlier, the substance of the site is of primary importance and must not be obscured by too many graphics, animations, etc. Additionally, the user must be involved in the course which is accomplished by making the site interactive. It is recommended that the user become involved as soon as possible. For example, in the instant course, after the user completes the registration materials and reads the course objectives, he or she is asked to complete a short quiz. Several general questions are asked regarding sexual harassment in the multiple choice and true/false format. Special care should be taken in selecting these questions because, in addition to providing interaction, the questions should be intriguing and create interest in the content.

For this particular subject matter, hypothetical scenarios are very useful and can be easily presented online. After providing the basic substantive information to the user, they should be asked to read a scenario and answer a short series of questions so that they can apply what they have learned. In Coursebuilder and Dreamweaver, the user can be taught many different concepts in the context of just a few scenarios by utilizing pop-up text boxes and links to other pages. For example, a user can be guided to the correct answer by pop-up messages that ask the user to consider additional information if they have trouble.

Conclusion

This paper has explored some of the basic technical and pedagogical concepts regarding the delivery on online sexual harassment training. A successful site takes time to create and requires the incorporation of appropriate colors, graphics, animation, and audio along with proper teaching techniques. The result is a very useful tool that provides much needed flexibility in the quest to educate faculty and staff members about sexual harassment.

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Old Ideas, New Approaches to Online Distance Learning

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Introduction

As the world moves steadily into the twenty-first century, schools are faced with a variety of challenges. The use of technology for the delivery of instruction is one challenge that is increasingly gaining notoriety in this new century. With increases in funding for instructional projects and the use of the Internet as a tool to enhance connectivity, schools have not only changed the way that technology is planned for, but also have changed the process of education which is adding new opportunities for educators, students, and the school community. One opportunity that is foremost in many technology based discussions is online distance learning.

Distance learning in itself is not new. Even the use of computer networks for the distribution of instruction can easily be traced back to the 1960s. However, with the development and expansion of the Internet, access to computer networks have become more readily available to the general public. Therefore the use of the Internet to deliver instruction at a distance is perhaps at best, a new approach to an older method of instruction. The situation in which many schools and institutions of higher education find themselves, is how to effectively design online programs that successfully facilitate the needs of both faculty and students.

An Innovative Approach

One university in the southwestern part of the United States has developed an innovative approach to online, web-based distance learning. The program is innovative in both its philosophy and its approach to web-based course delivery.

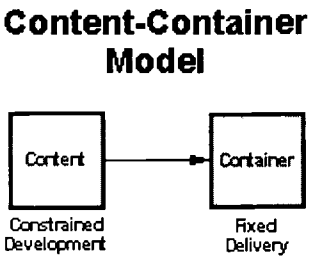
The innovative philosophy followed is one of seamless technology integration that sees all students simply as students of the university with no distinction being made in anyway between students who receive course delivery online or through traditional means. Through the application of this philosophy, online students are never left hanging without the support needed to help them succeed. Each student is placed with a faculty advisor who guides the student through the academic portion of his or her online studies. Further, student services are provided to assist students with the successful completion of their programs. Student services, ranging from admission, registration, financial aid, personal counseling, career counseling, and even student activities, are provided through the online environment. Additionally, a technical support facility is staffed with individuals trained in helping students with their technical questions or to help facilitate communication between the student and university or faculty members. At any point, a student can call, email, fax, or chat online with someone that can help with questions.

The program also follows an innovative approach to course development and delivery. All faculty who teach online must go through a 25 hour training program prior to delivering their first course. No distinction is made between faculty who teach online and those who do not. Faculty who teach for the distance learning program and those who teach traditionally delivered courses are the same with the exception of the additional training for teaching online. Most faculty go through the training program while developing their first course for online delivery. The training covers topic such as instructional design, methods of building strong communication and interaction, pacing the course, developing multiple methods of evaluation as well as the various technology tools available to the faculty member for use in a course. As a result of the online training program, most faculty have a major portion of their first course completed by the end of training. After training, faculty receive continued support through the Instruction Innovation and Technology Lab, which is the faculty development facility at the University.

The technical portion of the program is innovative with the in-house development of the course delivery software. Many course management packages are commercially available, but are often restricted to a single instructional design model for course delivery. It was determined that in order to provide the greatest amount of flexibility to faculty for the design of their courses while at the same time providing an easy to use consistent environment for students, a new course delivery system would have to be developed.

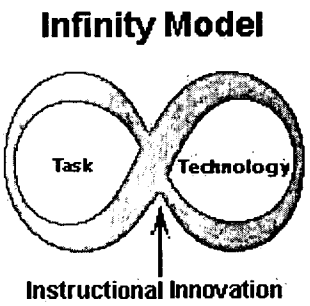
The software package has a strong theoretical basis and moves the theory into strong practice. Many commercial course management packages follow a content – container model for course delivery. This model sees the course content and the delivery container as being independent of one another. Faculty simply type up their content and copy it into the pre-defined container for delivery (Figure 1).

Figure 1.



However, the model used for this program sees the relationship between the content and the container as being reciprocal (Figure 2). In this model, faculty may choose many different instructional methods and designs to structure their content. Then the content and design is matched to the most appropriate technology for course delivery.

Figure 2.



By providing faculty with the ability to develop a "best-fit" between the instructional task (content) and the delivery technology, instructional innovation can be achieved for the benefit of the student. The uniqueness of this distance learning program is the development of an environment that allows the flexible design of instructional task and content while maintaining a consistent interface for students and faculty to interact within.

Outcomes

The program began in 1997 with one course serving 24 students. For the Fall 2001 semester, the program offered 79 courses that served 1574 students with 2333 course enrollments. This number not only represents student access to a quality institution of higher education, but it translates into a student savings benefit of over 5,587,231 miles of driving, 94,787 hours of driving time, and over $1,834,424 in driving costs. Students who would have to spend many hours driving are now able to spend that same time engaged in their studies, increasing their opportunity for learning success.

Degree requirements for campus-based and distance students are the same. Currently, the program has 141 total courses in its course inventory with over 120 trained faculty ready to deliver their courses through this delivery method. However, the number of courses is not nearly as interesting as the number of complete degree programs offered. The university offers it's Master's degree in Business Administration and it's Master's degree in Education, Instructional Technology totally online. At no point is it necessary for students to physically come to campus to complete either of these two programs. At the undergraduate level, the university offers a Bachelor's of General Studies, Emergency Management Administration and in Nursing (RN Completion). The number of programs and courses are constantly expanding to assist students in their desire for educational opportunity.

Quality

Survey research is conducted every semester to determine the demographic patterns represented by students who participate in the program. Further, student attrition, satisfaction, and benefits are monitored in order to inform faculty training, technological improvements and program development. Current research projects at both the graduate and faculty level covers such topics as online course quality assessment, mediated online communication, improved online instructional strategies, and improved interface design.

A Southern Association of Colleges and Schools (SACS) review committee made a physical visit to the university on May 8-9, 2000. After the review committee made its recommendation to the SACS board, a commendation and full accreditation of the university's Internet based program was awarded in January of 2001.

Conclusion

As will distance learning as a whole, the ideas utilized in the development of this online program are not necessarily new. However, this program has been highly successful in pulling many concepts together into a successful enterprise. Individuals attending this session will have the opportunity to see at least one method for delivering degree programs online. Attendees will be given an overview of how this program used the principles of seamless technology integration to build a program that represents and includes all areas of the campus community. Attendees will also see both the positives and negatives of building such a program. As has been seen with many failures with online education in recent history, the pit-falls that can doom this type of program are great. However, with strong vision of what the outcomes for a program should be, good planning based on sound theoretical principles, and a bit of luck, an online distance learning program can be a good choice for many schools.

Enriching Online Course Conferencing: Best Practices

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Abstract: A pervasive issue in online learning is the effective use of communications tools. In many instances, the creative uses of discussions, chats, and e-mail makes for a positive experience for learners and are critical factors in the level of student involvement in the course. This is especially true when conducting in-service courses or other adult learning situations where learners bring a rich array of experience that require a vehicle by which these experiences can be shared and passed along to their peers. In the design and delivery of numerous on-line courses implementing various technologies, we have experimented with and established a variety of best practices that are designed to promote high interactivity among learners. In effect, the use of these tools can develop better communications in instructor/student and student/student interactions and provide for more active student involvement. This paper ventures to present a series of useful strategies and best practices for on-line communication.

Introduction: One of the most common complaints by students after taking their first online course has been the lack of personal interaction that is commonly associated with the traditional classroom setting. Facilitating in-depth rich discussions as part of online class activities is one of the most critical elements contributing to a student's success or failure in an online course. Interaction with students has been found to be the most critical factor in student perception of successful learning experiences online. (Palloff, R.M., Pratt, K., 1999) This is especially true when conducting in-service courses or other adult learning situations where learners bring a rich array of experiences that require a vehicle by which these experiences can be shared and passed along to their peers (Knowles, 1978).

The level of involvement between students and content is seen as a critical factor in the retention of college students (Astin, 1992). Students can be encouraged and compelled to become actively involved with course content through creative and interactive online conferencing strategies. While only a few teaching methods are typically used in higher education, instructors have at their disposal a variety of instructional strategies that could be used to elicit the various types of

learning (Davis & Davis, 1998). In the design and delivery of numerous on-line courses implementing various technologies, we have experimented with and established a variety of best practices that are designed to promote high interactivity among learners.

Background: In early attempts at teaching on-line courses, many comments voiced ran along these lines: "I will never take an on-line course again!", "There were times when we forgot we had a professor.", and " I really miss the face-to-face contact with my fellow students." Students often hold preconceived notions of on-line education as impersonal, instructor-less courses. However, through experimentation and review we have developed a list of several practices to instill in students effective use of communication tools online. In effect, the use of these tools can develop better communications in instructor/student and student/student interactions and get students more actively involved in the course content.

Implementation: Through trial and error, several techniques have been tested over the last few years. Some of the techniques listed below did not always work well at first. But, through refinement and practice, the following methods have proven to work the best most consistently in promoting better interaction among students.

Use an icebreaker - This is a simple process. The first step is to ask students to introduce themselves briefly and then to follow up with an assignment to post photos and autobiographies to all class members. It is also important to create a practice area for students to feel free to practice interacting with each other between classes. It is important to lead with a question or assignment that encourages and requires each student to participate. Another warm up exercise is to devote the first 10-15 minutes of each class session communicating with each student about their work, their life events, etc. In effect, this begins to create a sense of community that is necessary to developing a successful teaching experience.

Student moderated discussions – This technique was designed to give the student control of the interaction and participate in the teaching process. Allowing learners to participate in the direction of the class has been proven to be an effective method of not only creating learner ownership but also to raise learner satisfaction. The process used is to have a student or group of students develop the discussion topic in which they would present or pose multiple concepts and controversial topics, which could be debated or discussed on-line. The individuals presenting are responsible to research a topic for the discussion board, and provide reading materials for the other class members. These materials are then disseminated either through e-mail or by posting to a designated website. During the class period, the assigned student(s) moderate the discussion through the use of an online chat. It usually works best to breakout the class into groups. Each group is then responsible to post their

responses to their respective areas on the discussion board as well as report a summary when going back into the total class chat.

Role-play – One way to involve students more thoroughly with the class content is to turn the conferencing area into a dramatic scenario or role-play environment. For instance, political science students can each represent country's involved in a summit meeting such as the G-8, and through the discussions, role-play a summit meeting on one issue, each student arguing for the concerns of their respective country. Separate conferencing areas should be used, one for the discussion and preparation of the upcoming role-play, and one for the role-play itself where individuals will 'speak' with the voice of their assigned role. This strategy could be useful to dramatize interviews of group project proposals, argue two sides of a legal issue, or conduct debates among philosophers.

Alter egos – The creation of alter-ego characters who represent extreme viewpoints about a content area could be useful in forcing students to recognize and react to various perspectives. In a course on negotiation, a professor can intermittently interject the opinions of extreme views using characters and encourage students to write responses appealing to these viewpoints. Some course delivery platforms allow instructors to alter the name of the submitter to further augment the presence of various 'voices' within the class discussion.

Various forms of groups – Online groups can take many forms. The class structure and logistics will often play as strong a role in how to create groups as the group project itself. For example, allowing students to self-select into groups may be desirable for a group project, but may require two weeks for the formation of groups alone due to the asynchronous nature of online collaboration. Online groups are also typically much smaller than groups in the traditional classroom. Success in a classroom-based team often hinges on the level of facilitation by the instructor. "Too much involvement and the team has no chance to develop its own cohesion, but too little facilitation and the team struggles and may lack a sense of purpose" (Arend, 2000) Also, strategies for including self-reported and peer-reported group grading sheets greatly assist the instructors' task of ensuring an equal share of workload within groups.

Team presentations – Team presentations, while often a logistical challenge online, remain an important component of online collaboration and should not be overlooked. Teams need the opportunity to showcase their achievements and gain constructive feedback on their many decisions and conclusions. Online presentations can take the form of live chat-based 'question and answer', PowerPoint, web page or other multimedia, asynchronous feedback, or any combination of technologies and methods. One of the most successful approaches is to have teams submit their presentation in a convenient format, such as pdf files, to the instructor who then posts the presentation on a class web site prior to the class session. In this manner, other members can view the

presentation during the class session.

Faculty responsibility – As the instructor in an online course, there is an explicit responsibility to engage as a member of the discussions. Students are reluctant to participate actively in an area where the instructor has no presence. However, too much interaction can prove equally detrimental. An instructor who responds to each student posting immediately may unwittingly create an environment of over-cautiousness and reluctance on the part of students to participate and to explore new ideas. Students will need a level of freedom to learn that online conferencing is a safe place to test out new thoughts. But, the instructor must balance this freedom with an obvious concern for the direction of the discussions, and input of expertise.

Finally, the Instructor must serve as a model and interact with the students throughout the course. If an instructor expects certain levels of thinking, formality, and even grammar and style, this should be modeled in all instructor comments. Students should be directed early on regarding the desired format so they may become familiar with essential communicating skills. They can more quickly focus on the quality of their comments. Some instructors choose to divide conference areas into informal, free exchange of idea forums, and more formal, graded discussion forums.

Conclusion: Ultimately, using these processes to encourage and develop confidence and skill with online interactions have had a number of highly positive implications for both the students and the instructor. There is greater ownership and cohesion among the students. Participation throughout the length of the course evolves as student investment in the course continues to grow. And, at the end, students are much more positive about their experience in the course.

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Beyond the Talking Head: Active Instruction in Online Instruction

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What are the strategies for working effectively with students in online learning environments? What can educators do to stimulate meaningful student discussion? This presentation will provide examples of both written responses and online chat environments that reflect creativity, quality questioning strategies and online options that will increase the ability for the faculty to interact with students on a timely basis. Cartoons, case examples, and a collaborative response strategy will be used to illustrate the active concept.

QIICC:
Student Empowerment through Distance Assessment

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Abstract

The QIICC Analysis feature of the Telequiz Assessment Protocol is a revolutionary method for analyzing student learning. The Telequiz Protocol has been used in Dr. Dwight W. Allen's Educational Curriculum and Instruction courses at Old Dominion University since 1997. The protocol allows students to take quizzes over the Internet at their convenience. These quizzes are comprised of randomly assigned multiple-choice questions based on the content of the course.

The QIICC Analysis feature allows for students to rate individual questions on several variables: Quality, Interest, Importance, Confidence and Challenge. The first three of these are fairly straightforward, however, the last two need some explanation. The purpose of this protocol is to attempt to discern how accurate students are in their understanding of their own knowledge, and to train them on how important it is to "know what you know."

Project Summary

Students are asked to provide a confidence level for each question comprised of three levels (high, medium and low). This data is meant to show how confident a student is in his/her answer. This data is then used, along with the answer accuracy, in order to calculate the score for individual questions. The scoring rubric is shown in Chart A:

Chart A: QIICC Scoring Rubric

Confidence Level	Question Accuracy	Credit Assigned
HIGH	Correct	5 points
MEDIUM	Correct	4 points
LOW	Correct	3 points
LOW	Incorrect	2 points
MEDIUM	Incorrect	1 point
HIGH	Incorrect	0 points

As can be seen, the maximum credit that can be received for any one question is 5 points, however, during the implementation phase of this grant, several scoring alternatives have been utilized. Initially, each question was scored out of 5 points, thus making the theoretical maximum the goal for each quiz. During the initial testing of this protocol, it was found that this was in essence detracting for students who were not absolutely confident in their answers, and so the grading rubric was changed to grade out of 4 points. This grading scheme rewarded the students for high confidence levels. It was found that this grading process worked best in the k-12 educational setting, however, the students at the university level demonstrated much more confidence in their answers, and the bonus point for each question lead to extremely lopsided scoring – in some cases as many as 30 bonus points were awarded per test. Due to this, the scoring rubric at the university level was adjusted back to being scored out of 5 points.

The final variable, challenge, allows students to challenge any question on a quiz. A challenged question does not count toward a quiz grade. Each student is provided with 5 challenges at the beginning of the semester, and can be allocated more for any reason found appropriate by the instructional staff. If a student uses more challenges than they have left an email message is sent to them indicating this has occurred, and the challenges (over the number they have been allocated) are turned to non-challenged questions.

Results & Implications:

The data analysis for the implementation of the QIICC protocol shows that there are substantial benefits to using the process. Average confidence levels have consistently been above 4.0 (4 being MEDIUM confidence and 5 being HIGH confidence) – regardless of test site. In fact, the only instance where the average confidence dipped below this 4.0 plateau occurred at the university level, and even then only by hundredths of a percentage point (3.98 during the initial summer testing). The highest confidence levels, by far, were seen at the 3rd grade in Brunswick County (4.84), which demonstrates an important point that was learned during this testing of the protocol; students in the elementary grade levels have difficulty making the confidence judgments requires by the QIICC analysis. When asked directly if a student knew the answer to a question, often the student would admit that they did not, however, once a

choice was made – regardless of whether the choice was correct or not – the student would show high levels of confidence in the chosen answer. The testing of students in the 5th and 6th grade in St. Louis showed a much more realistic understanding of their confidence levels - approximately the same, on average, as those students in the 11th grade that were tested (4.31 and 4.33 respectively).

More important than simply looking at the confidence levels, is looking at the difference that the QIICC scoring rubric makes in grades. Throughout the testing, analysis has been done to compare the QIICC grading rubric with the more traditional rubric involving 1 point for every correct answer. The results showed some startling trends. Every administration of the QIICC protocol showed that students performed much better, in terms of the scoring percentages, using the QIICC scoring rubric. Using the same tests, and running the two separate scoring schemes, the students scored as many as 22 additional points (on a 100 point scale) through the QIICC scoring. The process in the K-12 testing, where each question was graded out of 4, showed that the average score ranged between 78.4% (3rd & 5th Grade samples) and 88.9% (11th grade sample) on the assessments using QIICC. In comparison, these same tests, when scored using the traditional one point per correct answer showed the average score ranged between 61.1% (5th grade sample) and 66.6% (11th grade sample) depending on test site. The QIICC scoring rubric resulted in grading difference between 17.3 additional points and 22.3 additional points.

The results at the university level, where each question was graded out of 5 points, show similar differences. Depending on the quiz that was taken (each of the six quizzes was used as a distinct administration of the process), the QIICC scores ranged on average between 65.9% (6th Quiz during the summer) and 92.6% (2nd quiz during the fall), while the traditional scoring ranged between 49.8% (6th quiz during the summer) and 74.1% (2nd quiz during the fall). The comparison of the two grading rubrics shows a gain of between 16.1 and 21.1 additional points using the QIICC scoring rubric. Complete results are shown in Chart B.

Chart B: Scoring Averages Comparison

Administration	QIICC Scoring Average	Traditional Scoring Average	Additional Points Earned through QIICC Scoring
Quiz 1 Summer	79.0%	58.9%	21.1
Quiz 2 Summer	78.0%	60.9%	17.1
Quiz 3 Summer	83.5%	65.6%	17.9
Quiz 4 Summer	89.2%	70.3%	18.9
Quiz 5 Summer	76.8%	59.8%	17.0
Quiz 6 Summer	65.9%	49.9%	16.0
ODU Quiz 1 Fall	87.2%	68.9%	18.3
ODU Quiz 2 Fall	92.6%	74.1%	18.5
3rd Grade	78.4%	62.2%	16.2
5th & 6th Grade	78.4%	61.1%	17.3
11th Grade	88.9%	66.6%	22.3

Conclusions

Although further research is warranted, this initial study has allowed for a more complete understanding of how QIICC Analysis, in conjunction with the Telequiz Protocol, can influence the assessment of students at all different levels of schooling: elementary, secondary and post secondary. This research shows that there is tremendous potential for including students in the assessment process, and for making assessment a more meaningful process.

ELEARNING IN EDUCATION: AN OVERVIEW

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Abstract Elearning, as used in this presentation refers to the use of Internet technologies to deliver instruction. This objective of this presentation will be to examine the development of distance education from interactive video and computer-based courses to web-based instruction. The primary level of Elearning that this presentation will address is the use of web-based courses where 50% or more of the classes are online. This presentation will also address issues and problems associated with the implementation of Elearning.

Definition of Elearning

In a true sense, Elearning can be thought of as the delivery of information via all electronic media, including the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV, and CD-ROM. Although each delivery system has specific advantages and disadvantages, the power of the Internet has resulted in the rapid growth and expansion of Elearning in the form of web-based instruction. The most popular view today refers to Elearning as the use of web technologies to deliver instruction. Rosenberg (2001) has defined 3 criteria for Elearning:

- E Learning is networked, which makes it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information.
- It is delivered to the end user via a computer using standard Internet technology.
- It focuses on the broadest view of learning – learning solutions that go beyond the traditional paradigms of training.

Types of Delivery

Elearning can be based on a dichotomous "blended learning" model (Selix, 2001) that views learning delivery modalities as synchronous/asynchronous and online/onsite. Synchronous learning is learning in real time. The instructors or a group of instructors may lead the class through a series of meetings to deliver course content. The advantage of synchronous learning is the "live" student/teacher interaction. The disadvantage of synchronous learning is the limitation to learning at a specific time. Asynchronous learning is learning on learner's time as decided by the student. The obvious advantage of asynchronous learning is the flexibility of the student to decide when the lesson will take place.

The advantage of online learning compared with on-site learning is the savings in money and time for travel. The obvious disadvantage that is given most often by critics of Elearning is the loss of personal interaction with the instructor, although this may be somewhat disputed through the use of interactive web technologies.

Advantages & Disadvantages of Elearning

Proponents of online learning claim that Elearning delivered via the Internet is both efficient and effective in terms of learning and costs. Although Elearning is generally though of as cost-effective, the degree of instructional quality in Elearning can vary as much as instruction led by traditional methodologies. Course completion can also become a major issue. Elearners who enroll in asynchronous learning courses must have motivation, independent learning skills, and determination to insure completion of their work.

Elearning resource providers such as Click2 Learn claim that online learning has many advantages over traditional classroom learning such as high memory retention and consistency in quality of instruction. As teaching models shift from teacher-centered, "one size fits all" learning to student-centered, individualized life-long learning, web-based Elearning supports new pedagogies. Techniques such as self-paced learning, collaboration, simulation, and exploration may become central to the concept of online instruction.

Elearning in Schools

As is the case with many institutions of higher educations, the number of high school offering online courses in increasing. Elearning in the public schools provides increased access to learning and more learning opportunities for students of all ages in any location; however, educators are facing challenges including economic, networking, and access issues. The integration of Elearning into the curriculum will require careful technology planning so growing needs do not rapidly exceed resources.

Future Trends

Elearning had become a new form of knowledge transfer and a unique and exciting delivery system. Future Elearning trends are expected in the following areas:

- Continued Elearning growth and expansion in Education and Business and Industry
- A greater Elearning role in the public schools (Office of Educational Technology, 2001)
- Improved web technologies to disseminate Elearning over the web
- The development of new Elearning and evaluation standards.

As John Chambers, CEO of Cisco Systems has said, "Education over the Internet is going to be so big, it is going to make e-mail look like a rounding error." (Internet Time Group)

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From a Distance: Distance Learning Interactions

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Abstract: This paper is a report on the findings of a study conducted on a dually listed undergraduate and graduate TESOL distance learning course. Data were collected on the students' interactions with the course content and instructor to investigate differences in how graduate and undergraduate teacher preparation students interacted and responded to the distance learning delivery mode. Findings indicate that the graduate level students were more autonomous and confident using the new methods of course delivery than were their undergraduate counterparts. The implication of these findings is that the design of distance learning dually listed teacher preparation courses must provide for adequate support for the less experienced (undergraduate) learners. Suggestions for providing such support are included.

Introduction

Barry University in Miami Shores, Florida is committed to serving the needs of diverse populations. The teacher education programs at Barry University work with the community to provide relevant and accessible preservice and inservice teacher preparation courses. Teachers in the state of Florida are required to be ESOL endorsed; consequently, the teacher education programs at Barry University infuse TESOL courses in their preservice programs and offer TESOL courses at the graduate level enabling practicing teachers who are not yet endorsed to fulfill the state requirements. Large numbers of pre- and in-service teachers across the state enroll in the TESOL courses. To better meet the demands for such courses, Barry University designed one of the required courses, TSL 406/506 – Applied Linguistics, as a distance learning course.

The School of Education instructor who took on the challenge of redesigning TSL 406/506 as a web-based course had taught the course in a traditional manner many times and was, therefore, very comfortable with the content as well as the challenges that may arise from the course and strategies to effectively deliver the course. The instructor worked with the School of Education's distance learning design team to prepare the course for the distance learning format. Several elements had to be considered as the team began the design and development processes: 1) since the course was part of a state certification program, it must adhere to the standards and form that were in place for the traditionally delivered course; 2) the course is dually listed as both undergraduate and graduate courses, and, therefore, any given section of the course may have both novice and veteran teachers enrolled; 3) the course is a methods course and must balance theory and practice. The design team, with content, design, and technology expertise, collaborated to create a course that would serve the intended population.

Technological Implementation

Critical course elements for successful distance learning experiences were built into the course design. These were derived from the American Association for Higher Education's (AAHE) "Seven Principles for Good Practice in Undergraduate Education," principles of adult learning (Knowles, 1998) and various research, studies, and literature reporting on effective distance learning design (e.g., Moore and Kearsley, 1996; Driscoll,1998; and Horton, 2000). Elements incorporated into the course are listed in Table 1 with their corresponding strategies.

Course Element	Strategy Implemented
Communicate high expectations and encourage active learning (AAHE, 2001) through course organization	Content is organized into modules Assignments address the content through both the theoretical and practical perspectives
Provide depth and breadth of content to meet diverse interests and talents (AAHE, 2001; Knowles, 1998) of students	Selected readings address content in a variety of styles and present different foci Assignments are presented and completed in diverse formats (responding to classmates' postings, partnership options, case study assignments, field experience assignments, streaming video)
Promote interaction between student and instructor and among students and provide for prompt feedback (AAHE, 2001; Moore & Kearsley, 1996; Driscoll, 1998; Muirhead, 2000)	Technologies provide a means for both synchronous and asynchronous communications (live chat, discussion webs, email, fax, phone, and face-to-face) Option for partnering on some assignments is offered Instructor is available via email
Support students' management of time (Moore & Kearsley, 1996) and time on task (AAHE, 2001)	Modular format of content presentation guides students in managing their time spent on course Imposed deadlines for assignments further guides students
Support students' use of technology (Moore & Kearsley, 1996; Miltiadou, 2000)	Students attend an orientation session to introduce them to the technologies used and the format of the course Students have email & phone number of University technology Help Desk Students may email or phone instructor regarding technology questions
Motivate students to learn (Knowles, 1998; Horton, 2000)	Students earn (or lose) points for assignments Essentials of course (no frills or fillers) are presented Theory and practice are balanced, making learning authentic and relevant
Provide for self-directed learning (Knowles, 1998; Everett, 1998)	Modular format allows students to pace themselves to some degree Variety of supplemental readings allow students to engage in personal interests or areas of special need

Table 1: Critical course elements included and strategies used in their implementation

The Study

The distance learning professional development course was piloted in the fall of 2001and involved 14 students. The course was dually listed as an undergraduate and graduate course. Six of the enrolled students were graduate students, and the other eight were undergraduate. None of these students had previously taken a web-based course.

This study addresses the following research questions:

1. Is there a difference in how a pre-service (typically undergraduate) teacher embraces and applies the technologies in a web-based distance-learning course to the manner in which an in-service (typically graduate) teacher does?
2. What implications might differences in the approaches have for teacher educators who design and deliver distance learning teacher preparation courses at the pre- and in-service levels?

This study is informed by the research and literature base on teacher competence and experienced and expert teachers (Berliner, 1988; Sternberg and Horvath, 1995). Teachers, at various stages in their professional development, exhibit different behaviors in their teaching practices and in how they approach and plan for the teaching and learning experience. Generally, these stages of development are depicted on a continuum from beginning or novice teacher (which includes the pre-service teacher) to the experienced and accomplished (in-service) practitioner. Sternberg and Horvath (1995) propose an Expert Teaching Prototype, using three primary categorizations to distinguish the novice teacher from the expert: Knowledge, Efficiency, and Insight. Berliner (1988) describes Pedagogical Developmental Stages that portray and characterize the teacher in five developmental stages of professional development. These stages of development are not new to understanding how the novice and apprentice level teachers become expert and accomplished with typical classroom practice. This study, however,

seeks to determine whether or not the same or similar stages are evident in terms of novice and experienced teachers interacting with distance learning technologies in a professional development course.

The data derived from this study are in the following forms:

1. Assignments submitted by students
2. Frequency of student access to various course resources
3. Student messages to the instructor

Results

Data regarding the submission of assignments in four categories were collected. These data are listed below under the heading "Assignments Submitted."

With regard to the frequency of interaction with course content, the following data were collected. The graduate students recorded a total of 5141 hits to the course, which translates to approximately 857 hits for each of the six students. The undergraduate students recorded a total of 4619 hits, which translates to an average of approximately 577 hits for each of the eight students. The average of 857 hits for the graduate students is significantly different than the mean of 577 hits for the undergraduate students ($p = .05, df = 12$).

For the purposes of this study, the course was divided into three categories of pages: the Homepage that hosts various icons to access components of the course, the Organizer pages that open into other pages, and the Content pages. The Content pages list various components of the instructional modules of the course. Items Read are pages within the other structures. The averages for each group for these categories are reported below under "Average Hits Per Person." The following statistical observations result from an analysis of the data in the "Average Hits Per Person" section of Table 2. In terms of the HomePage, the average figure of 243 hits for the graduate students is not significantly different from the figure of 177 hits for the undergraduate students ($p = .05, df = 12$). Regarding the Organizer pages, the mean of 172 hits for the graduate students is not significantly different from the average of 129 hits for the undergraduates ($p = .05, df = 12$). In the area of Content pages, the average figure of 303 hits for the graduate students is significantly different from the figure of 144 hits for the undergraduate students ($p = .05, df = 12$). With regard to the average number of items read, the figure of 119 for the graduate students is not significantly different from the figure of 113 for the undergraduates ($p = .05, df = 12$).

The third category of data regards messages to the instructor, generally in the form of questions regarding various aspects of the course.

	Graduate	Undergraduate
Assignments Submitted		
Before due date	32	35
On time	84	92
Late	16	22
Late due to technology challenges	6	25
Average Hits Per Person		
HomePage	243	177
Organizer pages	172	129
Content pages	303	144
Items read	119	113
Messages to Instructor		
Planning ahead	5	14
Technology challenges	9	28
Questions about course content	17	35
Confirmation of assignments received	3	22
Concern about technology challenges affecting grades	2	8

Table 2: Quantitative data collected regarding student interaction in web-based course

Interpretation and Implications

Overall, it is clear that the graduate students interacted more frequently with the course content than did the undergraduate students. Further, it appears that the graduate students expressed less concern about technology

challenges and course content than did the undergraduate students. However, since all six of the graduate students were also preservice teachers in this pilot, it is impossible to identify any correlation between the graduate students' interactions in the course and pedagogical stages of development of teachers. One might look, however, to Sternberg and Horvath's (1995) Expert Teaching Prototype to generalize and draw parallels between the graduate students' experiences and "expert teachers." Sternberg and Horvath (1995) suggest an Expert Teaching Prototype that draws on psychological research on expert performance in a variety of domains. The three primary features distinguishing the expert from the novice are: Knowledge, Efficiency, and Insight. Briefly, the prototype suggests that experts bring more knowledge to bear in solving problems and do so more effectively and efficiently than do novices. Further, experts are more likely to arrive at creative solutions to problems than their novice counterparts. The expert, then, is knowledgeable and has extensive accessible knowledge that is organized for use in performance. Finally, the expert is planful and self-aware in approaching problems and is able to derive solutions to problems through selective analysis of information (Sternberg and Horvath, 1995).

Applying this concept to the current study, one could say that graduate students are more "expert students" and therefore perform at higher levels of accomplishment than do their undergraduate counterparts, despite the fact that the content is equally new to both groups. In the present study, the distance learning format was novel to all participants; but the more experienced students, the "adult" learners, appeared to be more capable of adapting to the new situation of adult learning experiences than were the less experienced students.

The implications of this for the design of distance learning (or traditional) courses that are dually listed as both graduate and undergraduate is clear: to make the playing field more level and to nurture the less experienced student, instructional designers must scaffold learning to provide opportunities for learners to better master the knowledge, to become more efficient in the processes of learning the content, and to develop insights that apply to the current learning situation and that are transferable to other learning experiences. The nature of the distance learning course is ideal for such an approach. Since much of the interaction of the course is done asynchronously, the distance learning student may choose which scaffolds to use. Some suggestions for revisions to TSL 406/506 are suggested:

1. *Embed learning/study skills into the course content.* Elements such as highlighted text to focus students' attention on essential concepts; hyper-linked text to examples of the concept in practice or to in-depth explanations; color-coded text to "arrange" course themes; and online tutorials in the use of basic technologies used in the course may assist the learner in developing a schema for learning in a distance learning format.
2. *Expand the course orientation.* A series of streaming video clips that address specific skills or knowledge required in the course, success factors for distance learning, and/or an explanation of the style of the course and its content may help "set the stage" after the initial face-to-face meeting. Including a brief course manual that addresses certain challenging issues or provides additional resources may provide a degree of comfort.
3. *Provide recommendations for time on certain tasks.* Offer suggestions for the amount of time that the learner should spend on certain tasks, helping the student budget his/her time. These suggestions might be written into the module with the assignment. Additionally, provide learners with suggested weekly time demands at the initial orientation session so they might build these into their calendars immediately.
4. *Engage students in more interactions with one another.* Establishing the social climate of the virtual classroom may provide learners with a degree of comfort to communicate and to work with one another. A virtual icebreaker at the start of the course that not only introduces students to one another but also employs some of the technologies that will be used in the course may help to establish a climate for success. Required virtual meetings scheduled one-third and two-thirds of the way through the semester to follow-up to the initial orientation meeting may help students stay on track. Authentic collaboration could be accomplished through group projects, jigsaws (groups of undergraduate and graduate students becoming experts on a topic from the course), and team projects.
5. *Highlight the relevance of the course to its practical application.* Include, at the beginning of each module, the purpose for the module content and its application to practice. Have students publish to the class web their field experience summaries and analyses and invite students to comment on or inquire about one another's remarks.

Conclusion

Although these suggestions may sound like a great deal of hand-holding, indeed, that is what we must do as we introduce the student to a foreign learning approach. As Dewey (1933) suggests, as teachers we must balance the old and the new; "The best thinking occurs when the easy and the difficult are duly proportioned to each other" (p. 290). Assuming the purpose of the course is to teach its content, the delivery system and approach must be made simple. The cognitive dissonance that occurs when the student is confronted with a completely unfamiliar approach to learning is, at first, challenging and stimulating; but if the delivery model continues to be the focus of the learning experience, we cannot expect students to meet our learning expectations with the curricular content.

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Teaming: A Catalyst for Transforming Distance Education Teacher Preparation Programs

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Abstract: This paper explains the concept of teaming as a literacy professor, a social studies professor, a teaching and learning strategies professor and distance instructors worked together to provide sound instruction and student support through the semester. Deliberate attempts were made to empower and include all students through the use of telecommunications technologies. A rationale for the field-based model, implementation procedures, and the program's overall impact will be discussed.

Introduction

This paper explores how a "team" approach was used to build community and to establish collaborative relationships in Interactive Television distance learning classes at Western Kentucky University. Distance learning continues to grow in popularity and application in post-secondary education around the world. While providing opportunities for many students, traditional and non-traditional, to achieve their educational goals, distance learning also presents institutions of higher learning, instructors, and students alike with many challenges. The antiquated mode of "transmitting" information via lectures and then holding students responsible for that information is further exacerbated by the lack of face-to-face interactions in most distance learning situations. Feelings of isolation, lack of participation, passive learning, and feelings of anonymity are sometimes characteristic of distance learners. Many times instructors leave the learning situation completely unsure of whether or not they provided effective instruction or if they were able to "reach" students on any level.

Recognizing that these obstacles often add to frustration for students *and* those providing instruction, an attempt was made by three professors and three instructors at distance sites to follow Vygotsky's tenets as they relate to the social aspects of learning, and to the role of teachers as facilitators of learning (Dixon-Krauss 1996). Much of the theoretical foundation that served to guide our decisions was based on Vygotsky's theories of the *social* nature of learning. This was modeled in the way we approached our collaborative meetings with the instructors, in the way we structured the types of learning activities we included in our syllabi, and in the way we interacted via the different modes of communication we employed throughout the semester. We also considered Vygotsky's Zone of Proximal Development as we planned for success – for professors, for instructors, and for students. We considered students active participants in the learning and employed a constructivist model of instruction. We defined the professors' and instructors' positions as mediators of the learning process. Technology served as the bridge between the different teachers and learners.

Structure

Western uses a "block" method for methods courses in its teacher education program. In that block method, three courses are taught as an integrated 9-hour course sequence. Block I includes social studies methods, reading methods, and a course in teaching and learning strategies. In the spring of each year, Block I is taught via Interactive Television to students on the main campus in Bowling Green and at three distance sites, namely Gasgow, Owensboro, and Fort Knox, Kentucky. The concept of *teaming* was incorporated as the university professors and the distance instructors worked together to provide sound instruction and student support through the semester.

Since these courses are "field-based," students meet in traditional lecture classes with professors for a portion of the day and then are in area schools performing practicum experiences for approximately four hours per day, two days a week. Instructors are in place at each distance site to facilitate students, make

arrangements at area schools for placements, and to share in the responsibility for student learning of core content.

During the spring of 2001, approximately 85 students were involved in Block I and were located at four different campuses, Bowling Green, Glasgow, Owensboro, and Fort Knox. In preparation for the semester, the three distance Instructors met with the three university professors in four face-to-face meetings and in multiple meeting via Interactive Television to set goals, define responsibilities, and to plan the calendar for the spring semester.

Methods

To accomplish our goals of building community we focused on how this collaborative relationship would "affect student satisfaction, retention, and learning" (Brown 2001). Both in-class and out-of-class tasks focused on students developing learning relationships with the university professors, the distance site instructors, and with other students in all four locations. A kick-off day at the beginning of the semester allowed us to meet, exchange email addresses with students from other sites, and to lay the foundation of what it means to be part of community of learners. Students left the session with four email addresses of students from other sites and instructions on how to begin to make "connections" with others in our Block. All university professors had "interactive" webpages in place to support each of the three courses and one Block webpage provided students a central point of information. Students were asked to complete a template-based webpage in CourseInfo within the first week of class. The information page in CourseInfo had to include items of special interest, favorite websites, hobbies, and other items that would allow students to get to know each other through this medium.

In consideration of the social nature of learning, we targeted *communication* as a component that would be paramount to our success in actively building a team with the instructors and a community of learners with the students. The use of technology in the form of multi-modal telecommunications provided for communication between professors and instructors, professors and students, and student-to-student interactions. Discussion boards, on-line conferencing, and asynchronous chatting capabilities formed the nucleus of our "beyond the classroom" communications. The following is a list of the types of communication modes we employed:

- Interactive Television laboratory – each student has a speaker
- Electronic Mail – all students were required to have an email address
- Telephones
- Fax Machines – in every Interactive classroom
- Face-to-Face Meetings with students at distance sites
- Web Pages – Professors maintained course web pages, each distance site had its own web page, each student developed a seven page web presence
- CourseInfo (Blackboard) – Discussion Boards, Personal Information Pages, Virtual Classroom Chats, Electronic Gradebook
- America On-Line Instant Messenger – Students could have synchronous conversations with professors during days, evenings, weekends, holidays

Results

Our teaming design served to make this an invigorating experience in teaching and learning. We constantly made notes about changes, improvements, and goals for future semesters. We collected valuable feedback from instructors and from students at both the main campus and from the distance sites. Discussion of findings and future challenges provide a basis for sharing our discoveries with others.

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Establishing a Learning Community of Media Design and Art Schools

The European North-South Axis

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Abstract: The objective of EDULA (European Design Schools and Universities Learning Alliance) is to develop and apply a novel, integrated solution for distributed joint lectures and student e-teamwork by combining technology, methodology and skill development. This approach, based on new innovative learning methods and fostering joint practical e-teamwork in combination with face-to-face and e-lectures that are common in most educational institutions, presents a new organisational form in education.

The EDULA solution will support the paradigm shift from classical lectures to ICT (Information and Communication Technology) - supported collaborative knowledge acquisition. EDULA will provide a collection of solutions, best practices and necessary education for the lecturers.

Preamble

In one of the literature depictions of the synergy of people and computers, the author (Pickover 1992) integrates people into the electronic environments. People began to see with "the eyes of the computer", they began to hear "with the ears of the computer" and they applied computer letters to write. At that point the above described was still a science fiction. Nowadays, in the era of ICT this science fiction vision transformed into the social fiction, as (Fassler, 1999) calls this phenomenon. The ICT makes it possible to communicate and exchange ideas without the physical boundaries. The application of the ICT also spread rapidly. At the beginning the ICT was available only to the smaller group of privileged people working at the governmental research institutions and universities. Nowadays ICT can be found in primary and secondary schools and in the majority of the average households. There is no night and day period in the virtual world, the communication and data exchange is intense and lasts 24 hours / day, seven days per week. One should only moderate and structure the information flows. Therefore we came to the conclusion to extend our teaching / learning process into the virtual world and to build a learning community. At this point we found the theoretical background in the work of Vygotski, who claims that a knowledge building community is a learning environment that supports the continuous social construction o f knowledge (Vygotski 1978).

EDULA - The Project

The general idea of the international co-operation of the Media Design and Art Schools is to increase the level of expertise exchange and to foster the skill development. The technology applied will be one of the available web-based learning platforms like (Hyperwave eLS) or (WebCT).

The Project Goals

Within the EDULA project three goals have been defined as follows:

G1: EDULA provides a European resource of ICT lecturing and student e-teamwork, available to all the interested parties, that fosters the introduction and application of ICT for knowledge acquisition. The "knowledge pool" has to be considered as a resource of guidelines and practical examples that can be taken over as a form (model). Based on the model different topics e.g. practical projects and lectures could be carried out.

G2: EDULA will develop and apply an integrated solution for joint lectures and e-teamwork in distributed learning institutions. The solution will be applied and adapted in a series of trials in different learning domains. Joint lectures will be formally acknowledged by several partners.

G3: Workshops will be organised and carried out to educate the educators in the terms of application of the ICT technology for lecturing and student e-teamwork.

Enabling the knowledge exchange without the boundaries makes it possible that the knowledge flows without limitations and that students have the possibility to make decisions about their studies i.e. what, why and how do they prefer to learn. Students can decide to enrol in a course based on their estimation that the knowledge acquired within the chosen course will have the best value for their further professional development.

The experience offered within a knowledge-building community is the experience of the international e-teamwork. Within a chosen course, international student e-teams will be formed to work on a project. Elaborating the project solution, students will be actively involved in cross-cultural communication. This situation is much like the situation in professional life where an international experts team spread worldwide cooperates within a common project. Being part of such an international e-team enables the students to acquire also a certain spectrum of social skills. Students get involved into the active collaborative knowledge acquisition. By means of discussion and opinion exchange among the team members the process of collaborative knowledge building takes place. At the same time the students will gain rich experience in applying ICT at the e-teamwork. Based on these experiences, they will learn how to organise appropriately the work and collaboration supported by the ICT.

The Model of Work

The reported project was designed to apply the ICT to make a pedagogy shift from 'classroom-based-lecture' mode to a 'problem-based-learning', similar as stated in (Ferry and Kiggins 1999).

The pilot project is divided into two major steps.

(I) step: a small pilot project that will be carried out. In the stage of the pilot project only two groups of limited number of students (3-4 per group) from two sites will participate. Other partners will be active observers, meaning their input will be in form of their experiences, suggestions to which ICT to apply, etc.

The pilot project will be concluded with a workshop where all the participants will meet in one place to exchange their experiences and to evaluate as follows: (a) the project product i.e. the problem solution and (b) the methodology of work. Based on the evaluated workshop results a 'best practice' model for an on-line lecture will be made.

(II) step: in the following semester the 'best practice' model based on the pilot project will be translated into various on-line lectures to produce effective student learning. Based on the model defined different contents will be added. There won't be any limitation of student groups.

As shown in the Figure 1, in this phase of the project the 'best practice' model will be verified within various contexts and the evaluation will be again carried out. The proposed model will be refined and extended if and where necessary. Additional list of possible applications of the model in the practice i.e. various contents will be defined and described.

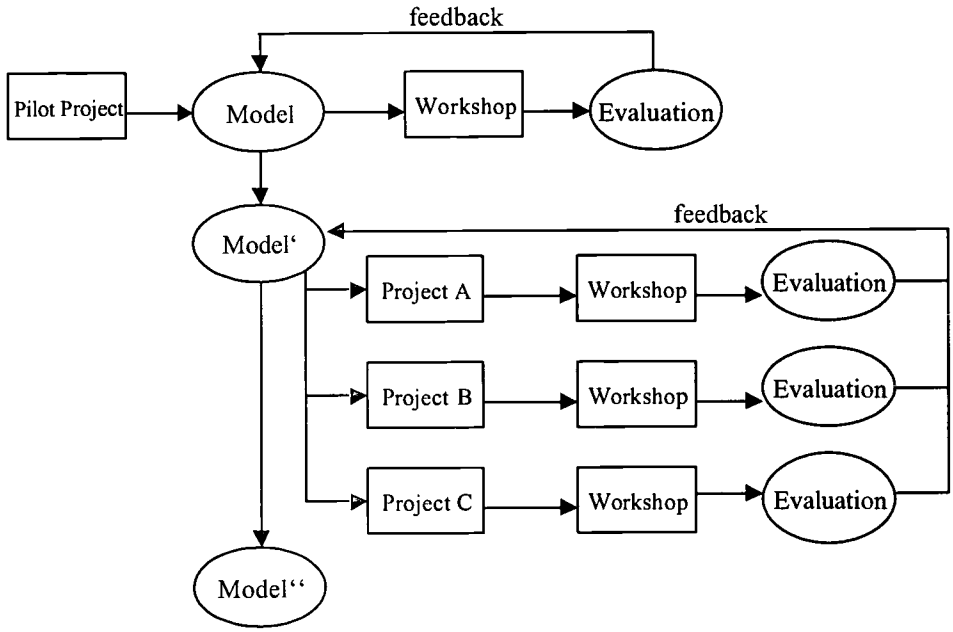

Figure 1: The EDULA model of the work

The Subject

The first project the students with work on will be to define a specification of a content management system (with the functionality of a communication and information distribution platform) and to make the appropriate information pages. The students have different expertise. One group of team members has the expertise from the information design and the other group of team members has the expertise from databases and web programming. The hypothesis is that different expertise background will contribute tremendously to the collaborative knowledge building process and will make it possible to break the project into sub-tasks that has to be solved.

A content management system has to meet various requirements. The system should be a web-based tool and it should support structured communication among team members and among various teams. However, the platform will be used also by the international partners to share the 'best practice' models defined and to exchange the experiences.

Based on a specification a decision will be made if an available platform e.g. eLS or WebCT or similar offers adequate support. In case that additional functionality is required the tools will be extended in the required manner or a hybrid solution will be applied.

The information pages will be designed for the information distribution on various levels. First level (I) is considered to be a general information level, where basic project information and international partner data will be provided with the intention to inform the public about the project and the partner pool. Some information on on-going project in form of a summary could also be posted. Second (II) information level is to be considered as a cover communication and information for the pool partners and should be password protected. On this level the meeting announcements as well as the meeting presentations and minutes will be published. A separate area should be defined on the same level that will contain a list of 'best practice' models along with detailed description, case and evaluation data. On the third (III) information level the communication for the on-going projects should be enabled. The third level should also be password protected and it should make it possible to define exclusive project specific space to simplify the navigation and avoid the possible distraction and confusion.

Evaluation

Evaluation will be carried out sequentially after each joint project is finished i.e. once per semester. Evaluation results will have a direct impact on the best practice model. Based on the results the model defined will be adjusted and extended.

A model, that encourages us to critically question any form of new technology adoption consists of four elements as follows: (I) new pedagogical opportunities, (II) changed work practices, (III) technology (non)neutral and (IV) unintended consequences of new technology adoption. [Fox R: Digital Environments: Monitoring Changes to Teaching]

Various factors will be evaluated. Some evaluation aspects are as follows: does an interdisciplinary and cross-cultural project contribute to the motivation of students, does it raise the involvement of the students, is there an improvement of the knowledge acquisition and knowledge utilisation. The other point of view is the perspective of teacher, how they were able to provide support to the international group, if they sensed any difficulties by coaching the team, explaining the project topic.

Conclusions

The results expected from the EDULA are as follows:

1. To make a collection of best practice models of ICT application for joint lecturing (enclosing the entire project documentation: detailed project specification along with learning objectives, problem description, lecture model applied, technology specification, project results and evaluation results)
2. To provide workshops on the use of the ICT for lecturing with the presentation of practical applications, that will be carried out at least twice per year and organised at various partner locations
3. To organise a knowledge management platform that will be a major source of information related to the innovative application of the ICT for lecturing
4. To define several joint courses / lectures, acknowledged by all partners, that will be carried out by lecturers coming from various educational institutions, based on intensive application of the ICT for e-teamwork

All partners are making active efforts in the direction of international exchange of students. Based on the EDULA, the exchange students could have more options to choose the courses of their personal interest and to participate at the joint courses offered together with other partners within the EDULA.

Students with rich experience and high competence level in applying the ICT for co-operation and team work will project the application models into business environments. The collection of verified "best practice models" and paradigm shifts can be applied for various situations and will therefore be supportive for a wide range of the population.

The whole EDULA concept, including ongoing projects, evaluation results and best practice models of the ICT application for lecturing will be published and presented at the international conferences. Another form of presentation is participation at the exhibitions, where the e-teamwork projects along with the project results can be displayed for the public. Based on the EDULA concept workshops will be organised twice a year by various partners to educate the lecturers and mediate the experiences gained.

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Semi-automated evaluation services in a distance education program

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Effective evaluation of student work is an important and time-consuming component of distance learning programs. The authors describe the design and development of a scalable, computer-based approach that permits personal review of student work while automating much of the evaluation process, including the recording, storage and distribution of grades.

Statement of the problem:

As distance education programs expand their course offerings and numbers of students, the impact of the expansion on faculty support issues must be considered. Although the use of on-line course tools has made possible the actual delivery of instruction to growing numbers of students without significantly increasing demands on faculty, the same cannot be said of associated support issues such as viewing student work, assessment of student performance, providing relevant feedback, and recording and distributing grades. Systems are needed to automate as much of the support process as possible while relieving faculty of some responsibilities for student evaluation and preserving the benefits of interaction with students.

Description of project:

Virginia Polytechnic Institute and State University has offered a distance education Master's Degree in Instructional Technology (ITMA) for the past three years. The first iteration of the program was offered to three distinct cohorts; members of these cohorts graduated in May 2001. A second iteration of the program began in the fall of 2000 and a third iteration began in the fall of 2001. The number of students in the additional iterations was more than double the students in the first iteration while the number of faculty members has remained constant. During this same period, the on-campus course loads for Instructional Technology faculty have remained constant.

Without changes in faculty support services, a substantial increase in on-line students without a corresponding decrease in on-campus course load would have been unworkable. As more students were added to the distance education program, additional time was needed to respond to student questions regarding grades, evaluate and provide feedback on student work, and record grades. Without additional faculty or faculty support, the current faculty would have been overwhelmed and the program could not have grown.

Recognizing the need for additional support, program funds were provided for faculty support in the form of two part-time graders for the ITMA program. To achieve optimum utilization of the graders, provide ongoing feedback to the learners, and maintain the quality of the program, a system was required to minimize unnecessary efforts in grading and feedback. The system had to permit graders to easily access student work, provide comments based upon faculty-generated rubrics, assign grades to the work, and record, store and distribute the grades.

Two faculty and three graduate students from the Instructional Technology program explored the means by which the above responsibilities could be shifted from faculty to support personnel without sacrificing quality feedback. The process began with a series of sessions aimed at systematically describing the features and outputs of the ideal support system without reference to any specific technology. After the characteristics and capabilities of the ideal solution were fully specified, they were converted to technology-related terms. Finally, technologies whose outputs matched the requirements were examined and eventually a combination of technologies selected.

The design and development team collaborated to produce a web-based student/grader interface. Using off-the-shelf software (Cold Fusion and Microsoft Access), a semi-automated system was developed and implemented that allowed students to enter assignments, review grading criteria, and examine scores. Assignment information entered by students was made available to graders who, with the click of a button, could automatically retrieve grading rubrics, assign points, and post grades. The system also allowed graders to enter comments that were stored, along with the other grading information, for future reference and analysis. Numerous other options to eliminate unnecessary steps by graders were included as part of the system. For quality control purposes and to identify student problems, additional information was collected automatically by the system. For example, data dealing with elapsed times between submittal and grading were recorded, as was information concerning numbers of failed attempts to submit assignments.

The web-based system was designed and developed to be scalable. Additional courses and cohorts can be added to the system. The system also was created to function for a variety of purposes. For example, the same approach that was used for submittal of course assignments can be used later for submittal, review, and assessment of student portfolios.

Outcome:

The semi-automated, asynchronous, web-based system was implemented in January 2001. Early problems with the system were relatively minor and typically related to inadequate grader training, failure of users to follow instructions or, in a limited number of cases, the absence of error-trapping safeguards in the system. The system allowed two part-time graders to evaluate and record relevant information for over 1000 assignments from a total of 80 students during a 10-week period. Rubrics for additional courses have been developed and added to the system. The system is being reviewed for possible use by other distance learning and on-campus courses. Efforts are currently underway to integrate the grading information with the software used for the delivery of instruction.

Relevance to other institutions:

The faculty support system described in this presentation provides an effective and efficient means to deal with evaluation services resulting from increased numbers of distance education participants and courses. The system is applicable to any discipline and can be adapted to both large and small audiences. The system retains the benefits of personal interactions while automating numerous steps in the evaluation process.

The system may be used in any distance education and on-campus program where evaluation of student work is based on clearly defined rubrics. The system collects and stores faculty-defined data that can be used for evaluation and research purposes. The fact that data are stored in a standard database format simplifies future retrieval and analysis.

Suggested Audience

The audience most likely to benefit from the presentation would include any person involved with designing or developing faculty support systems for distance education programs, including administrators, faculty members, trainers, and instructional designers.

Technology As The Classroom: Successes and Pitfalls of A District's Journey into Cyberspace

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Parents have chosen to home-school their students for many years. Home-schooled students have long been isolated from the school environment. A growing number of students are being removed from the school environment for a myriad of reasons, and many more parents are electing to home-school their children, especially in the wake of school violence. While these students may be outside of the school building, the school is not absolved in their responsibility to educate them, particularly those that are excluded from the classroom environment. In the past, teachers were hired to work extra-duty hours to educate these students separately. However, with the increasing availability of technology, teachers are able to remotely access student's records and teach and communicate with students. An online curriculum is needed to address the already alarming shortage of teachers, the overwhelming cost involved in having an at-home teacher that the district must support, and the often-prohibitive distances involved, particularly in rural areas. In many states, a need for a comprehensive online curriculum arises when both home-schooled students and students who have been removed from the confines of the traditional classroom request or require by law access to the general education curriculum. A public school district is legally responsible for educating all students in that district, and in Colorado, a state of school choice, parents can elect to have their children attend any school in the state. Because of this, students should be able to access the curriculum of any school in the state, and an online curriculum is certainly a viable and exciting answer.

Englewood Public Schools in Englewood, CO, chose to make this leap into online curricula in April of 2001, when we contracted with NCSLearn, formerly the Computer Curriculum Corporation. Funds to pay for this project come directly from the state, as excluded, home-bound and home-schooled students receive a disk and user name and password free of charge. The primary focus for this project was to provide both our excluded students and home-schooled students both inside and outside of district boundaries with the general education curriculum that they needed and deserved to enrich their educational experience. In order to serve these students, two system administrators/curriculum specialists have been added part time to not only manage the system but also manipulate the curriculum to create an appropriate individualized instruction plan that meet the needs and address strengths of each student. The two curricula have a range from pre-K through 8th grade and 2nd grade through post secondary. Both curriculum focus on reading (mechanics, technical reading and reading within the content areas), writing, math, and civic responsibilities and citizenship. Because of technical issues and other barriers, and to achieve our overall goal of a cutting edge district in distance learning, research into other possible curriculum providers continues. In addition, the future holds promise that an online program for teacher inservice courses can be either contracted or created by district personnel. Such a program was part of the initial goal of the program and is becoming one of the next priorities.

Currently, there are 25 students enrolled in two different curricula. So far, the largest hurdle has been keeping students independently motivated to complete the required number of hours, 90 per semester. However, those that are motivated by working with the technology have been very happy with the program, and have been achieving at a much higher rate than is available to most students. This session will address the successes and pitfalls of this program, and give parental and student feedback on both the program as a whole and the curriculum. In addition, plans for the future will be addressed. A handout detailing the program with information about the curricula and web addresses for more information about the district will be provided.

A Rubric to Encourage and Assess Student Engagement in Online Course Conferences

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Abstract: Although student interaction and engagement in online discussions or "conferences" is a required component of many online courses, instructors often find it difficult to assess whether or not students are adequately and meaningfully engaged in online discussion activities. Instructors in a web-based education degree program offered by the University of Maryland University College (UMUC) developed a conference participation rubric to serve two roles: (1) to encourage greater student participation in online course conferences and (2) to assess and grade performance in these activities. This paper reports on the instrument developed for this purpose and discusses faculty and student reactions on its usefulness in the program 's online courses.

Introduction

As has been noted in many previous studies of distance courses, (Roblyer & Ekhaml, 2000; Zirkin & Sumler, 1995), interaction is considered one of the most important characteristics of successful distance learning environments. Although the distance instructor has the responsibility for incorporating most interactive qualities of an online course, at least one dimension of this interaction is incumbent on the students themselves: voluntary responses to online discussions or "conferences." However, it is difficult to impress on students the importance of their contributions and involvement to the success of a distance learning enterprise, let alone articulate what is required for them to interact adequately and effectively.

Many strategies have been suggested for how to foster engagement in online conferences (Klemm, 1998). Instructors in the UMUC online programs have been trained to incorporate these strategies in their online course designs, and UMUC students report high degrees of satisfaction with their online learning experiences. Graduate education faculty at UMUC decided that giving students a conference participation rubric might serve several important functions in online learning environments. First, it would act as a benchmark for behaviors expected of them in online discussions. Second, it would act as a strategy to encourage their appropriate interaction in online forums. Finally, since rubrics originally were designed to be assessment tools for complex, problem-based, environments (Jonassen, Peck, & Wilson, 1999), the conference rubric would serve to help online faculty evaluate student performance in an area of online learning that traditionally has been difficult to assess.

Methodology Used to Develop and Revise the Rubric

Initially, three elements of conference participation behavior were identified, and a rubric was developed by creating a 0 – 4 scale (0 = lowest) with descriptions of levels of performance for each element. The draft instrument was posted in an online faculty meeting and faculty members were asked to review it and suggest revisions. Also, it was posted in an online graduate course on web-based pedagogy to solicit

student comments. All were asked to evaluate the rubric using criterion measures for rubrics described by Jonassen, Peck, & Wilson (1999, p. 225). These criteria focus primarily on the identification of useful elements and include: comprehensiveness, clarity, and unidimensionality (elements could not be broken down into two or more behaviors). Faculty members also were asked to comment on the rubric's usefulness for their own purposes. Some 15 instructors and students responded with comments and suggestions, and the rubric was revised based on their feedback.

As a result of faculty and student feedback, several revisions were made. One element (Frequency of Posting) was divided into two elements (Frequency of Posting and Timeliness of Posting) and various revisions were made to the wording of the levels. The wording of several levels was revised to make them clearer and to sharpen the focus on desired behaviors. For example, in the original rubric draft, several students cited ambiguity in the wording about timeliness of interaction. Faculty noted that quality of contributions related to two different aspects (relationship to topic and quality of writing). The revised rubric elements are described here; a copy of the revised rubric itself is shown in Figure 1.

Rubric Element #1: Frequency of Posting

Although perhaps not the most important aspect of participation, the number of posted comments is one measure of engagement in the discussion. Also, most discussion conferences have a central theme, but more than one concept or topic is developed in the course of the conference. This element of student engagement focuses on a combination of how frequently the student interacts in the conference and on how many different concepts interaction occurs.

Rubric Element #2: Timeliness of Posting

Although most discussions are asynchronous, they are most useful and meaningful when students join discussions promptly. To encourage prompt participation, UMUC instructors usually set deadlines for joining the conference. This element focuses on joining by deadline, as well as responding in a timely way to concepts under discussion. If students respond very late in a thread, the discussion already may have developed to the point that their reactions are not as meaningful as they might have been if posted earlier.

Rubric Element #3: Type of Posting

Students have the tendency to think of interaction as communication required only between instructor and student (instructor-to-student and student-to-instructor). But, as Moore (1989) emphasized, there is an additional kind of interaction: student-to-student. This element communicates that all three types of interaction are important and expected. This element also addresses reacting to concepts raised in the conference as opposed to initiating new ones. Ideally, students should do both.

Rubric Element #4: Quality of Posting

The quality of student participation in an online conference seems at least as important as the quantity of postings. This element attempts to address three characteristics of meaningful participation. The first, most basic requirement is that comments relate to the discussion. Sometimes students inexplicably post comments that have nothing to do with what is being discussed. (This may illustrate lack of reading of required texts or simply lack of understanding of the concepts involved.) The next important aspect of quality is that comments reflect knowledge of the background reading. Students' opinions should be more than personal views; they should be analyses of the materials they have been reading. Finally, student writing is a measure of quality. Comments should be succinct and well-formulated. Sometimes student comments either are wordy and rambling or too terse; either can limit their contribution to the discussion.

RUBRIC DIRECTIONS: The rubric shown below has four (4) separate elements that reflect aspects of engagement in online discussions (conferences). For each of these four elements, circle a description below it that applies best to the student's participation. After reviewing all elements and circling the appropriate level, add up the points to determine the student's online engagement in the discussion (e.g., low, moderate, or high).

Low engagement	**1 - 6 points**
Moderate engagement	**7 - 11 points**
High engagement	**12 - 16 points**

	Element #1: Frequency of Posting	**Element #2**: Timeliness of Posting	**Element #3**: Type of Posting	**Element #4**: Quality of Posting
Level 1: Basic (0-1 point each dimension)	Does not join discussion at all (0 points) or makes only one comment (1 point)	Does not join the conference at all (0 points) or joins later than deadline (1 point)	Does not react to or initiate discussion with anyone (0 points) or reacts only to the Instructor (1 points)	Offers no comments at all (0 points) or offers comments unrelated to topic (1 points)
Level 2: Low (2 points each dimension)	Contributes only once or twice to discussion; if more than one concept is discussed, contributes on only one of the concepts	Joins the conference by deadline, but either is slow to respond to discussion points posted by the instructor or other students or does not usually respond to them at all	Reacts to Instructor and at least one other student, but never initiates any new concepts or threads to discuss	Gives comments related to topic but are personal opinions only; comments reflect no knowledge of literature covered in course
Level 3: Medium (3 points each dimension)	Contributes to discussion more than twice; if more than one concept is discussed, contributes on more than one concept	Joins discussion by deadline, and usually responds in a timely way to discussion points posted by the instructor or by other students	Reacts to Instructor and at least one other student, and initiates one new concept or thread for others to react to	Comments reflect knowledge of literature covered in course but are wordy & rambling or too terse to be uninformative

Level 4: High (4 points each dimension)	Contributes to discussion several times; if more than one concept is discussed, contributes on all concepts discussed	Joins in a timely way, well before end of required time, and always responds in a timely way to all discussion points posted by the instructor or other students	Reacts to the Instructor and several student postings, and initiates one or more concept or thread for others to react to	Comments reflect knowledge of literature covered in course and are concise, but well-formulated
Total = ____ of 16 of possible points	**Total on Frequency of Interaction = ____ of 4 points**	**Total on Timeliness of Interaction = ____ of 4 points**	**Total on Type of Interaction = ____ of 4 points**	**Total on Quality of Contribution = ____ of 4 points**

Figure 1. Rubric to Measure Student Engagement in Online Course Conferences

Perceptions on Usefulness and Uses of the Conference Rubric

In general, students' comments indicated enthusiastic support for the rubric. Faculty reviewing the instrument had some reservations about how much time it would take to assess each student properly. However, all comments indicated approval for posting such an instrument to set expectations and guide performance. In actual use for assessment purposes, faculty may choose to weight one or more of the elements to reflect their perceptions of the importance of each aspect of online participation. For example, one faculty member felt actual number of postings (Element #1) was a faster and more feasible measure for faculty to emphasize in grading. Other faculty members felt that the number of postings was not as important as the quality. To facilitate its use as a grading tool, faculty also may choose to ignore certain elements or levels of this instrument and focus on only a subset of them. However it is used, a rubric of this kind seems a useful tool to encourage and guide student participation in online conference activities.

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Structuring Distance Education Programs to Enhance Preservice Teacher Preparation

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Abstract: The traditional way education programs provide an opportunity for preservice teachers to think about and apply pedagogy has been through onsite field experiences. In this paper we explore the use of distance education as a supplement to the current field experiences. We suggest that distance education is an excellent vehicle for delivering vicarious field experiences and structuring practice with reflection. The concept of virtual field experiences is explored. The impact such experiences can have on the development of essential habits and skills of reflection are considered. Benefits of using supplemental virtual field experiences and six guidelines for them are provided.

Teacher education programs continuously grapple with finding ways to provide instruction and experiences that develop students' teaching expertise. One way in-service teachers develop expertise is through reflecting on, critically thinking about, the instruction they provide. Classrooms provide teachers with opportunities to apply and reflect on the application of pedagogical principles. Currently, the student teaching field experience is the primary time when preservice teachers reflect on the application of pedagogical principles, rules, and terms to classroom settings. Many teacher educators, however, now question the use of field experiences as the primary vehicle for linking theory and practice. How successful the student teaching experience will be is greatly dependent on how effectively the student teachers can reflect, or make connections between their experiences and/or observations in the classroom and larger ideas. Many preservice teachers have not engaged in professional reflection and are unfamiliar with how to reflect on their professional practice. Logically, preservice teachers should develop the essential habits and skills of reflection prior to beginning their field experience.

Technology can be a powerful tool in helping preservice teachers understand and grasp educational concepts that may be difficult to explain in traditional formats (Hasselbring, et al. 2000). As described above, the traditional way to provide opportunities to think about and apply pedagogy to teaching has been during real life field experiences. We suggest that distance education is an excellent vehicle for delivering vicarious field experiences and structuring practice with reflection. During lessons, or virtual field experiences, transmitted via satellite or ISDN videoconferencing *p*reservice teachers can gain access to real life classroom instruction. They can begin to ask questions of children and cooperating teachers. By providing this preparation early in a teacher education program, prior to the student teaching experience, preservice teachers will be better prepared to make the most of their student teaching experience.

In this paper we explore the use of distance education as a supplement to the current field experiences. Below is a discussion of benefits of using virtual field experiences. Six guidelines for structuring the videoconferences are provided.

1) *Make the experience valuable.* Videoconference sessions should provide something that cannot be achieved through other traditional means of education. It should support course content and student learning. Virtual field experiences have been especially beneficial to undergraduate and graduate nontraditional students who commute and work during the day and therefore attend evening classes making extensive real life field experiences difficult. For these students, distance education provides a viable alternative to some of the preservice field experiences and supports their acquisition of professional skills and knowledge. For example, videoconferencing with schools on the west coast of the USA can provide real time virtual field experiences to students who attend school at night in eastern states. An added benefit of virtual field experience is that it can provide exposure to diverse cultures and backgrounds of children living in the southwest, northwest and possibly other countries. Thus exposing preservice teachers to multicultural issues and environments not available to them through other means.

2) *Follow a formula.* Both the college students and the school children need to become accustomed to participating in the videoconference. As students participate in additional videoconferences they will become more comfortable with the technology. Setting up routines that can be counted on will facilitate higher comfort levels. We suggest that the videoconference consist of (1) a teaching segment, (2) time for the grade school children to ask question of the university students, (3) time for the university students to ask questions of the grade school children, (4) time for the university students to ask questions of the cooperating teacher, and (4) time for the cooperating teacher to ask questions of the university students.

3) *Balance distance education with face-to-face discussion.* As described above the discussion with the cooperating teacher and students done online. However, including supporting face-to-face discussion with peers and the university professor prior to and after the videoconference should improve the experience.

4) *Use three key processes.* The following three features are essential to the process of learning how to reflect: modeling, scaffolding, and fading. Modeling is when someone demonstrates an expected and/or appropriate behavior (Bandura, 1989).

Modeling of cognitive behaviors involves verbalizing or writing down the thinking behind the behavior (Eggen & Kauchak, 1997). Scaffolding refers to the instructional support that allows a student to perform a skill (Vygotsky, 1978). Scaffolding applied to teacher education means that the teacher educator initially provides a considerable amount of support through explanation and demonstration. As the teacher candidates demonstrate their ability to carry out more of a task independently, the scaffolding is withdrawn. This is referred to as fading. Fading is essential to individual and shared accountability. The videoconference sessions should including three features at varying intensities, dependent on the stage in the students' developmental process.

5) *Practice makes perfect.* There should be ample opportunity for group and individual reflection about observed instruction. This practice should be provided at earlier stages in the preservice teacher's career as guided and independent practice during methods classes. Preservice students may continue collaborative reflection with each other and the professor asynchronously during student teaching via e-mail and discussion groups instead of attending on-campus seminars.

6) Focus on three kinds of knowledge. The reflection should foster the establishment of connections between student teachers' experiences and pedagogical knowledge (Clark, 1995; Ross, 1989; Shulman, 1992; Siens & Ebmeier, 1996; Sparks-Langer & Colton, 1991), including declarative knowledge (knowledge of terms and facts), procedural knowledge (how to use declarative knowledge), and strategic knowledge (when to use declarative knowledge and procedural knowledge).

Virtual field experiences can prepare preservice teachers to make the most of their student teaching experience. It provides time for preservice teachers to practice asking questions- a skill essential for their continuous life-long professional development. Additional, this distance education project allowed faculty at the university to model exemplary pedagogy that integrated technology in meaningful ways.

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Creating, Implementing and Sustaining Community in a Online Distance Education Course

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Abstract:

In this presentation we will discuss some of the unique features of an online distance education course: : 1) the online course design was created in such a way to manage the information overload that could occur with 45 students; 2) a team of three faculty from Towson University designed and taught the course; 3) students negotiated all but three of the course topics and selected the topic their small group would present to the class; and 4) the class used and modeled the use of distance technologies (we only physically met as a group three times).

Introduction

This course, **Distance Education Theory and Practice**, was taught to graduate students across the state of Maryland using constructivist teaching strategies and case-based modules designed to bridge theory with applied practice. The course was unique in several ways: 1) the online course design was created in such a way to manage the information overload that could occur with 45 students; 2) a team of three faculty from Towson University designed and taught the course; 3) students negotiated all but three of the course topics and selected the topic their small group would present to the class; and 4) the class used and modeled the use of distance technologies (we only physically met as a group three times).

As a result of completing this course, students were be able to:

- Demonstrate knowledge of the principles of distance education and related delivery technologies.
- Understand how to select, evaluate, and integrate distance education strategies into learning/training environments.
- Use distance education methods and technologies with confidence.
- Critically analyze and reflect on the nature and complexity of on-line learning environments.

Students attained these goals through research and the completion of two major projects. These projects included, the facilitation of class lessons and the evaluation of existing distance-based programs. More importantly each of these two projects were done by the students cooperatively, with peers, via on-line technologies.

Team Teaching

This course was team taught by three faculty members of the College of Education at Towson University. Originally, the course was to be offered on the Towson University campus and at two satellite sites, as three distinctly separate courses. Following some discussion, it was believed that we could make better use of our resources by offering the course on-line and teach the course as a team of three. This decision offered benefits for both the students and the faculty. This benefited the students by giving them a larger group of peers to work with and a resulted in richer and thicker discussions of subject matter, ideas, opinions, and reactions. In addition, it allowed them the opportunity to learn from the strengths and experiences of multiple faculty rather than a single faculty member. The team teaching benefited the instructors by allowing us the opportunity to share ideas and, similarly to the students, learn from each other. The faculty had varied backgrounds and experiences with distance education and teaching in an on-line environment. Teaching as a team gave us the opportunity to focus on teaching the topics we knew best and had the most experience. This provided the students with better instruction with each course topic covered.

Course Design and Structure

Distance education courses are often plagued with student disorientation and alienation which effects course retention and the quality of the experience for the students (Harasim, Hiltz, Teles, & Turoff, 1995; Schwitzer, Ancis, & Brown, 2001). In order to meet this challenge head on, the three faculty in the course purposefully designed a structure that grouped students in small, medium and large groups to build a greater sense of connection for the students.

Online Environment Courseware

The course was taught using WebCT internet-based learning technologies. WebCT is a learning management system that provides an overall structure to create an online learning environment. The instructor can choose from a variety of

tools and can customize the look and feel of the course. In order to develop a sense of community within the course communication tools (i.e., email and discussion groups) were critical. Students also made use of synchronous Chat and Whiteboard technologies offered within WebCT. The final component integrated to establish community within the class was the student project space. This area offered file-sharing options for groups while they worked on collaborative projects and a space for the other students to view their work when it was completed.

Grouping Students

In teaching the course, the students were divided amongst the instructors into three groups. A concerted effort was put forth to mix all of the students from the three geographical instruction sites so that they would not have a tendency to work with peers locally and avoid using the distance-based technologies. From these three sections of 15 students each, groups of three and then groups of five were formed with each student belonging to a small and then larger group. Individual learning journal spaces offered the smallest grouping between the instructor and each student. Each group was provided with a project space to share files and present information to the class as well as private group discussion spaces.

Assignment Projects

This grouping strategy offered a way to build social relationships at a variety of levels within the course. The groups were tasked with a project that with individual student roles where each student was assigned a role by the group. The group of three facilitated a two-week discussion in the bulletin board for their section (15 students) on a course topic they selected. Students were required to choose from a list of pedagogical techniques for their facilitation method and a classroom assessment technique (Angelo & Cross, 1994) to formatively evaluate their instruction. The larger group of five's task was to evaluate a distance education program using the American Council on Education's Distance Learning Evaluation Guide (1996).

Developing Community Through Student Interactions

We began the process of building a community with an all-day, face-to-face orientation. In the orientation, students participated in activities that allowed them to become comfortable with WebCT, creating Web pages, navigating Internet. They also participated in team building activities designed to help form create relationships that could withstand a distance.

Students completed learning journals at the end of each week. Within these learning journals the student reflected on their learning and the strategies they were applying within the on-line learning environment. Faculty not only supported them in their learning process on-line, but also posed critical questions for student to reflect upon. The learning journals established a close relationship between instructors and students. This allowed the student to build a stronger connection and sense of support in this foreign environment.

Participating in on-line discussions at multiple hierarchical levels within the projects produced reciprocal relationships and robust interaction (Roblyer & Ekhaml, 2000). These reciprocal relationships began at the small group level and were reinforced within and through the discussions in the larger groups. The design and implementation of the various group structures were integral to the successful interaction and community formation throughout the semester.

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Distance Education: Can the Institute Affect Persistence?

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Abstract: Distance Education (DE) is the perfect solution for today's non-traditional learning. However, the attrition rate in DE environments is much higher than in "traditional classrooms". The topic of increasing persistence continues to be a concern among distance institutions. This paper studies methods that administrators and instructors can institute to increase persistence.

Introduction

Many institutions are making substantial investments in new technologies for teaching. Colleges are evolving in response to the pressure of student diversity, technological change and economic restructuring. Pressures to change will continue, if not accelerate. This change will have significant impact on colleges. If colleges and universities are going to respond to the pressures and educational needs of the adult learner, they must offer distinct, comprehensive, and pedagogically meaningful learning environments. There have been innumerable studies done on improving the quality of distance education (DE). There is one exceedingly important area that continues to be a concern, the subject of student attrition. DE programs throughout the world are characterized by having higher attrition rates than their campus-based counterparts. It is imperative that colleges identify what leads DE students to drop out and then to take appropriate preventative measures (Morgan & Tam, 1999).

Persistence and Retention Strategies

Until now, much of the research has been limited to studying a single variable as it affects attrition. The combining of multiple variables as possible predictors of attrition has generally been overlooked. It is more appropriate to use an approach that can help to identify the interrelated facets of the experience. Recent research has regarded student persistence as a multivariate problem involving complex interactions over the period of the course (Kember, 2001). Primarily, most students will give reasons such as the "lack of time" as an easy explanation for drop out. It is not contested that time constraints are indeed a factor in student non-persistence, but the importance attributed to them may be misleading. The second is that both non-persisting and persisting students experienced situational, institutional, dispositional and epistemological problems that posed barriers to completion. Yet, some students persisted while others did not (Garland, 1993). It should be noted that of these four characteristics, situational and dispositional barriers to persistence are beyond the control of the college or university. However, research indicates students list at least one institutional or epistemological barrier during their participation in a distance-learning program. Since these indicators are within the control of the institution, it is both the challenge and the responsibility of the educational institution, instructional faculty and support staff to address the issues that are under the college's control and thus strengthen the positive experience for the students. To improve retention in DE, institution retention strategies must address epistemological and institutional problems related to the improvement of the educational environment of the distance learner in the hope of tipping the balance toward retention (Morgan & Tam, 1999).

Distance Learning needs to have the best technology infrastructure. Hardware and software required for the course should be prominently listed on the site to ensure that a minimum of problems occurs. There should be a downloadable technology manual. The institute should require a one time face-to-face orientation that trains students in the needed technology skills and provides familiarity with the course delivery tool. Some institutions have been able to reduce attrition by assisting the student with a self-perception inventory. In order to provide the locus of control and just-in-time support necessary to DL, technical support should be provided via e-mail, phone and fax.

The creation and operation of a DE support infrastructure requires the collaboration of all departments whose activities deal with students and faculty. Distance students are often faced with the challenges of tracking down the appropriate contact person for questions. Staff specific to the DL program should be added to existing staff to ensure students have access to the range of students' services appropriate to support their learning. The admissions process gives an early impression of the institution.

The web site should provide a page that clearly describes the admissions process and requirements, and should provide an online application form. Applications may be submitted online, faxed or mailed. There should be a staff person designated to process DL admissions. Financial aid information should be easily found, accurate and straightforward. Registration is an important online administrative service. An effective online registration system should be provided. Academic advising is a core student service. There should be a staff person designated to provide counseling to the DL students concerning course selection, concerns and requests. A distance library should be provided with remote access to databases, electronic resources and journals. A distance reference librarian can be contacted via e-mail, fax or phone (Dringus, 2000).

This ever-evolving landscape of distance education requires the distance educator to develop new skills. From an institutional perspective, as distance education programs are implemented, decisions must be made regarding hiring and training of instructors. There is currently no expert to answer the inevitable questions as to training DE teachers. What competencies or skill set will be needed? What competencies are more important, technical, interpersonal, instructional or management?

The teacher must view the instruction in an entirely different manner. The educator will need to change thinking and teaching styles into an effective educational environment that focuses on the needs of the learner. Many teachers are not adequately prepared to teach online. They are not ready for the difference between teaching and management of an online course and a face-to-face environment. They absolutely must not learn how to teach online as they proceed, but they should be trained and confident before they enter the online classroom. The instructor's role in a Web-based environment demands newfound skills and pedagogical philosophies (Sims, 1998). Instructors must understand that teaching in an online environment is not just about delivering content it is about communicating. Students in DL are separated from the other learners and the instructor. Communication and interaction among the students and the instructor can help to decrease the feeling of isolation by forming a sense of community. Studying at a distance requires a high degree of motivation. A primary goal of communication in DL is to motivate students rather than just provide information to them (Abramson, 1998). Having teachers complete a self-assessment survey before teaching in a DE program helps to ensure that he realizes guided conversation must be understood as a fluid role, and one in which conversation is multi-directional and inharmonious. As the instructor transitions from the classroom to DE vast changes occur in their functions. It is critical to provide skill training, and it needs to focus not just on the technology, but to focus on the learning environment. Faculty should partake in a training program to: 1) develop an understanding of issues associated with teaching and learning when instructors and students are separated by distance and/or time, 2) acquire the skills needed to design effective instruction, facilitate DL, and integrate DL resources, techniques and instruction, 3) stress the need for timely feedback and developing a sense of community, and 4) understand the differences in teaching adults who bring a wealth of experiences to the "virtual classroom" (Bond & Finney, 2000). Instructors also need to experience being students in a distance environment; one way to do this is to do part of their training through DE. It is also beneficial to institute a mentoring program where experienced instructors mentor new instructors.

Conclusions

By carefully identifying and dealing with the institutional and epistemological barriers that are within the distance-learning institute's ability to improve, DL institutions may well find that more students are persisting. The more enlightened the administrators become in the study of attrition, the sooner the scales that measure and compare attrition rates in distance courses and traditional courses, may come to a balance.

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The Significant Challenge
That Distance Learning Represents to Educators

Abstract

Distance education, e-learning, Web-based courses, etc. represent opportunities for educational institutions, faculty, and students. There is no doubt about that, assuming that these myriad initiatives are appropriately orchestrated.

What educators must realize is that conducting courses within these delivery modes is a tremendous amount of work, plain and simple. They will be challenged at every turn and in ways that they likely did not anticipate.

The success of their course(s) ultimately depends upon how they apply themselves as educators to the task before them or at hand. If they approach these efforts with anything less than the utmost in preparation, comprehensiveness, dedication, and positive attitude they will be risking failure and term-long struggles and disappointment. They and their students will likely have a negative learning experience. This is, of course, just the opposite of what we all want to achieve, every time we enter a classroom, regardless of what form today's classroom might take.

They are dedicated to learning, determined to do an exemplary job of delivering and facilitating outstanding educational quality. They best be prepared for the associated amount of time, effort, and care that must go into both developing online courses and delivering them with the requisite amount of associated academic rigor.

This short paper and presentation will include but not necessarily be limited to the following:
1.developing the online course
2.producing a comprehensive syllabus
3.setting learner expectations
4.detailing educator expectations
5.taking advantage of all of the available features and resources in a given platform
6.synchronous course components
7.asynchronous course components
8.educator availability issues
9.what can go wrong will go wrong
10.framing the best possible course and learning experience.

This could also be done as an interactive discussion, enabling participants to share, respond to, and offer recommendations for the significant challenges that they face as educators conducting courses at a distance.

Short paper will follow.

Skills, Modifications, and Obstacles: Teaching Online Courses at the High School Level

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The Internet is redesigning the way courses can be delivered to students, with the result that time and space no longer constrain teachers or students. Harrison and Bergen (2000) state that "internet access is becoming more widespread and its capabilities for delivering multimedia lessons are improving daily; the Internet is becoming the vehicle of choice for distributing learning across distances" (p. 57).

Delivering coursework online is a relatively new concept in education; however, it is has become a valuable tool for increasing educational opportunities for high school students, especially those living in rural areas. For example, some rural high schools in Louisiana are not able to offer advanced courses because they lack qualified teachers. Because of this, capable students at these schools have not been able to meet the requirements to qualify for the Tuition Opportunity Program for Students (TOPS), Louisiana's comprehensive college scholarship program. In order to provide equal opportunities for all high school students, the Louisiana Center for Educational Technology implemented the Louisiana Virtual Classroom Project during the 2000-2001 school year. Now, all students can participate in web-based classes taught by certified teachers while completing the requirements for a TOPS scholarship.

Purpose of study

The purpose of the study was to examine the implementation of the Louisiana Virtual Classroom Project to determine the skills that teachers needed to teach Internet-based courses, the modifications teachers made to their teaching practices as a result of teaching in virtual environments, and the obstacles they faced.

Methodology

Participants

Eleven teachers were chosen to teach the first online courses. Each had five to ten years of teaching experience in their field, and all had taught in the same subject areas in which they designed their web-based courses. They received a $6000 stipend to design and teach a course for one year. Five of the eleven teachers participated in an in-depth study. These five were chosen based upon subject area and their willingness to participate. Jeanne taught Algebra I; Claire, Fine Arts Survey; Edith, World History; Blanche, Exploration and Analysis of Environmental Issues, and Paul taught Survey of American Literature. The project began in August 2000, and approximately 140 high school public and private high school students enrolled.

Data Collection and Analysis

In-depth case studies of five teachers were developed. Data collection included observations, interviews, pre- and post-surveys, the Profiler instrument, and responses that had been posted on a discussion board. Because the purpose of this study was to examine the experiences of teachers, student data were not collected. Data were analyzed using the constant comparative method to examine emerging theme and patterns across cases.

Discussion

Essential Skills

Organizational skills. Teachers discovered that they needed to be more organized when teaching in an online environment and noted that students appeared to be more comfortable when course materials were organized systematically. The teachers also found that they needed good organizational skills to manage the curriculum. As a result, some of them had to eliminate a portion of their teaching materials, because the time lapse between the assignment distribution and assignment return was too lengthy. Often, several days passed before the assignments were returned from students. Edith, Paul, and Claire stated that they reduced the number of assignments due to the lack of time. Harrison and Bergen (2000) found that in reality, teaching in an online format requires teachers to be more organized than in a regular classroom environment. In turn, the students are then able to post their materials and assignments online in an orderly fashion.

Technical Skills. The teachers in this study also indicated that prior technical skills are extremely important when teaching a virtual course. Although the participants possessed technical skills as teachers, they felt they should not be responsible for any internal server problems and online glitches that intermittently prevented students and teachers from working on the course. Even though the teachers knew how to correct a locked-up computer, they could not configure a computer to connect with network or troubleshoot connection problems in actual practice. Wang (2000)

noted that before teachers can move on to the integration stage of technology, they must first possess basic computer skills.

Teaching modifications

Course format. To manage instructional materials in an online format, the teachers divided their courses into blocks, units, modules, or components. This method prevented the students from feeling overwhelmed. Within each section, a theme or a specific topic was addressed and online resources were included. Three of the teachers stated that they had revamped their traditional lessons to include online resources. In addition, the teachers found that in the beginning, students had problems adjusting to an online learning format. As a result, the students turned in assignments late or not at all. As the semester progressed, the majority of the students submitted their work on time.

Cooperative learning. All of the teachers integrated cooperative learning strategies into their online courses and used e-mail, live chat, and the discussion board to promote collaboration and interaction. Teachers explained that student participation in project-based learning enabled them to assess students' levels of participation and whether individual students were actually achieving the goals established for the course. Students also benefited from cooperative learning through peer feedback and review their work.

Obstacles

Technical problems. All of the participants had expected technical problems to be resolved before their courses began. However, in August, Edith and Blanche both remarked that e-mail was not working at the Blackboard site; in October the Blackboard e-mail still was not working, so the teachers decided to use the students' personal e-mail addresses to send information. Students also experienced frequent technical problems while taking online quizzes. To remedy this, Blanche and Claire taught the other teachers to reset the quizzes. Jeanne stated that the chat rooms tended to freeze most of the time; so Blanche suggested alternative forms of communication for students, such as NetMeeting or Tapped In. Teachers also reported that the Blackboard server malfunctioned frequently – either at night when they were trying to post assignments or on weekends when the students were attempting to complete assigned activities. The teachers stated that they often were frustrated with the situation because they were unable to work on their own courses or assist students when the server was down. Teachers also noted that students needed procedures for getting help when they were unable to access their courses. There was no full-time technician available at the Louisiana Center for Educational Technology to provide technical assistance to the teachers and students in this project. Research conducted by Grenier-Winterh (1999) indicates that technical issues for an online course need to be addressed before the implementation stage begins.

Lack of support and a sense of isolation. Teachers felt that more communication would have been beneficial and recommended that an online discussion forum be established at the beginning of the school year so that teachers can share ideas and solve problems. Teachers also wanted additional support from their principals and thought it would be helpful to require principals and staff members who serve as contact personnel at the schools to attend an orientation explaining their roles. Teachers commented that students also needed additional support. Most of the students were unaware of the contact person at their particular schools, and the teachers thought that regular meetings with the contact teachers and students at each school through Compressed Video would be helpful.

Summary

The Louisiana Virtual Classroom teachers began the school year with little knowledge of how to develop or implement online courses. Although they had studied how to do it and attended an orientation, they had not participated in an online course themselves. Consequently, the teachers were basically on their own instructionally and technically as they organized their courses' content, adjusted the format, and reconsidered the amount of time for assignments. They also realized that they had to include more cooperative learning activities to promote interaction between students. The teachers felt that they needed more support from the state technology center and from their principals. Teachers also thought that students needed additional support at the school level. Finally, tech support is crucial if online course delivery is to be effective. The Louisiana Center for Educational Technology used the findings from this study to improve the Louisiana Virtual Classroom Project for the 2001-2002 school year. Because online delivery, especially at the high school level, is relatively new, the findings from these case studies should be helpful to high school teachers or college professors who are interested in developing and implementing online courses.

Collaborative University Teamwork in Designing a Distance Education Course for the Government
Submitted by Penelope Semrau, Ph.D. and Barbara A. Boyer, Ph.D.

This presentation describes a project to educate a team of college students in designing and developing an online course for the National Security Agency (NSA) utilizing constructivist methods of teaching.

This project involved converting a face-to-face National Security Agency (NSA) course to a multimedia web-based course. The conversion involved a team of undergraduate and graduate students from Instructional Technology, Art Education, Computer Science, Special Education, and Graphic Design. Representation of various cultures was taken into consideration when selecting the students. In addition, two students were already teachers in the public schools and had experience in curriculum development. Two professors directed the project – one from Instructional Technology and the other from Art Education. The focus of the team was on collaborative group work and a constructivist approach to learning. Constructivist approaches served as the basic foundation for organizing and developing the project "...where students develop their knowledge through team collaboration, discuss different interpretations of a problem, and negotiate and synthesize ideas drawing from various disciplines" (Boyer & Semrau, 1995, 14).

The students were trained in new skills and how to research and work collaboratively.
Training was provided on html, Photoshop, Premiere, MediaCleaner, Pagemill and the designing of web pages. WebCT was used for managing the website, communication and collaboration, and uploading pages.

A major focus was to keep the web course interactive emphasizing learner control. Useful tools for designing constructivist approaches to learning are hypertext and hypermedia because they allow for a branched instructional design rather than a linear top-down approach. It was also important in the distance education course that there be a balance between the text and the use of graphics, diagrams, video and audio to reinforce the learning.

Through this project the students became constructively involved in their own learning and acquired in-depth experiences in collaborative learning and team approaches. The students became empowered as creators of their own curricular materials and web pages instead of being passive viewers of others'. All of Bloom's higher level taxonomies were implemented: Students analyzed websites, synthesized criteria they had researched, applied their book readings, compared and contrasted criteria, designed and produced their own web pages, and focused on sound educational practices. As Gibson (1998) noted "...we, as distance educators, need to be learner-centered reflective practitioners" (p. 143).

This presentation identifies the five stages involved in creating a distance education course. With every stage, specific strategies are detailed and actual solutions are illustrated.

1. Planning and Development of the Content
2. Layout and Design of the Website
3. Implementation
4. Editing the Content
5. Assessing Learning and Evaluation

Establishment and Improvement of the Distance Learning Project at Inter American University of Puerto Rico, Bayamón Campus

Yolanda Serrano, Inter American Universtiy of Puerto Rico, PR
José Guillermo Santiago, Inter American University of Puerto Rico, PR

The Inter American University is the largest private university in Puerto Rico with nine campuses and two specialized schools, and a total of 46,000 students. The Distance Learning Project of the Bayamón Campus was developed during 1999 by faculty members, students, administrators and technicians. The project started on January 2000 with 11 courses, 13 faculty members and 250 students. During this academic year, 19 courses, 25 faculty members and 460 students are participating in this project.

Nevertheless, some difficulties have been observed: first year students don't have the computer skills necessary to participate in online courses; the first group of online courses created didn't have uniformity in design; the process of involving faculty members in the development and design of online courses has been slow; and some technical problems with the university net and the online course platform ("Learning Space) has been observed.

However to improve this project, the following determinations have been adopted: a questionnaire was created to make students aware of their abilities, aptitudes and computer skills necessary to complete an online course. Also, a previous interview by the professors with the student is recommended. Guidelines have been created for the development of the new online courses, with emphasis on the use of a diversity of tools. Continuous workshops are given to faculty members interested in the creation of new online courses and technical support is provided to those who are already offering the courses. Technical problems of students and professors with online courses are channeled through the Faculty Support Center and the Coordinator of the Project.

MOTIVATIONAL STRATEGIES FOR THE WEB-BASED INSTRUCTION

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Abstract: Motivation is generally defined as the magnitude and direction of behavior, the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983). Web-based instruction offers various bonuses to promote and develop intrinsic motivation in learners. Intrinsically motivated learners are learners who are not only interested in completing the requirements for a course but who also have a personal awareness in grasping the content. There are several instructional motivation theories that provide helpful perspectives. In this paper, based on the ARCS (Attention, Relevance, Confidence, Satisfaction) model some instructional strategies will be presented for Web-based instruction.

Introduction

Motivation is generally defined as the magnitude and direction of behavior, the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect (Keller, 1983). There have been several motivational theories and models in educational psychology such as Expectancy-Value theory (mainly represented by Atkinson's theory of achievement motivation and Rotter's social learning theory), Theory of Achievement Motivation, Social Learning Theory, Attribution Theory, etc. Most of these theories could be beneficial for instructional designers to be aware of motivation in various ways. However, they do not provide systematic guidelines for instructional design. On the other hand ARCS model provides integration of numerous strategies for increasing motivation. In addition, this model integrates motivation theory and motivational strategies with instructional design theory (Keller, 1983).

ARCS Model

The ARCS (Attention, Relevance, Confidence, Satisfaction) model is useful for instructional designers because it helps understand the construct of motivation in terms of four distinct categories, provides the systematic motivational design process, and motivational strategies (Song & Keller, 2001). The ARCS model gives a rich descriptive synthesis of concepts and theories of motivation combining systematic approach to motivational design. It also offers motivational strategies and tactics.

Components of ARCS Model

Attention generally refers to establishing and maintaining curiosity and learner arousal. Relevance is related to linking the learning situation to the needs and motives of the learner. Confidence refers to the learner attributing positive learning experiences to their individual behavior. Satisfaction deals with developing the desire to continue the pursuit of similar goals (Keller, 1992).

Web and Motivation

Web-based instruction offers various bonuses to promote and develop intrinsic motivation in learners. Intrinsically motivated learners are learners who are not only interested in completing the requirements for a course but who also have a personal interest in understanding the content. Web-based instruction offers many ways to develop intrinsic motivation in learners. With its information-rich environment in multimedia forms, the Web can help to generate curiosity and interest in students. This visually appealing and information-rich space can easily arouse and sustain attention in the content. The Web can also provide equal and non-judgmental environments, in which everyone can participate, each with an equal voice. These kinds of environments provide critical thinking; enhance confidence, and that lead to feelings of satisfaction that are intrinsically reinforcing.

Suggested Strategies for the Design of Motivating Web-based Instruction

Based on the ARCS model there are several strategies that can be offered. Some of the commonly used strategies for each components of the model as follows (Visser, 1998; Cote, 1998);
To *gain and sustain Attention*:

- Use novel, surprising, incongruous or uncertain events.
- Stimulate information seeking behavior inquiry.
- Maintain interest by varying elements of instruction.
- Provoke mental reasoning and problem solving by sending students to Web pages with differing opinions.
- Use good screen design to capture the interest and attention of the learner.
- Use relevant multi-media elements to help keep students on task.
- Build interactivity into the instruction.
- Do not send all of the materials at the same time; only send the next part of the course when the learner is about to finish the first delivery.
    - If this is not an option, an additional text or paper could be used to help the learner focus.

- Use a variety of media.
- Send occasional encouraging letters (e-mail) which focus on the material, or on the part already done (satisfaction).
- Send a challenging or provocative message to the student.
    - The mere arrival of an unexpected message will stimulate attention of the learner.
- Provide speedy feedback on assignments.
- Use frequent short questions.
- Include challenging statements that help the learner to reflect on the course content.
- Show real (and not fake) interest in how the learners progress through the course.

To *provide relevance*:

- Use concentrate language and use examples and concepts related to the learner's experience and values
- Use strategies that match the motive profiles of learners
- Show how instruction relates to the student's future goals.
- Try to apply instruction to real world scenarios.
- Demonstrate why the material is important to the student.
- Adapt course requirements to the learning style of the students.
- Inform learner of what is expected (state objectives).
- Give feedback to relate the course content to the learner's goal.
- Help learners to understand on how the instruction they are doing can contribute to solving the (professional) problems they are facing or can enrich their performance.
- Help learners to define priorities and to manage time.
- Provide samples of assignments.
- Stress relevance by giving examples, especially in the feedback on assignments, that relate to the learners' daily circumstances
- Explain in detail why a learner has to do certain things.

To *built a confidence*:

- Provide performance requirements and evaluative criteria
- Provide multiple achievement levels, personal standards, and opportunities for learners to experience success
- Build in frequent summaries and reviews.
- Provide opportunities for the students to interact with the instructor, other students, and the instructional materials.
- Inform learners in detail about what is expected of them, not only by describing the objectives of the course/lesson, but also by defining the standards of performance as to, among others, the organization of their assignments and the marking key.
- Clearly define standards for measuring performance and grading the learners' work
- Help learners feel that they have control over the outcomes of their work
- Require learners to submit their first assignment early in the course. (Lack of confidence is often the reason for delays)
- Introduce feedback loops that allow students to catch up or to improve.
- Stress that learners will succeed if they work hard
- Give credit for even minor improvements and if possible give learners positive feedback.
- Provide variety of opportunities for students to be successful. Letting students know they themselves are, or have been, responsible for their success through their personal ability and effort also increases and builds confidence.

To *develop a satisfaction*:

- Provide opportunities to use newly acquired knowledge in real or simulated settings
- Provide feedback and reinforcement that will sustain the desired performance
- Share work done on the Web with others, especially at other institutions.
- Utilize fair rewards that are based on the quality of work produced.
- Encourage collaboration among students as they develop Web-based assignments.
- Provide frequent, timely and adequate, encouraging feedback
- Use remarks like "This is really an interesting piece of work."
- Keep learners informed about their progress through the course

Conclusion

Teachers with a profusion of experience are designing classroom instruction. However, those teachers have limited experience in designing web-based learning. This paper presented an introductory instructional design model for incorporating motivation into course design. It is believed that specific strategies and ideas for using ARCS model to design motivating web based instruction can be beneficial to designers. A clear and understood goal of most education is mainly to motivate learners to desire to learn and to find satisfaction in learning rather than just completing the assignments to get a grade. It is not easy to encourage this kind of motivation. But it is obvious that Web-based instruction may offer some advantages and extra help.

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Camp Internet Distance Education Program

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Camp Internet is a K-12 distance education program currently providing daily classroom curriculum and programming for over 9,000 students in Southern California. Over the next year, through a new USDA RUS grant the program will include an additional 300 classrooms in Arizona, New Mexico, Colorado and Nevada. Sponsored by the California Department of Education and the USDA Rural Utilities Service as well as through private subscriptions by school districts such as Los Angeles Unified School District. The Camp Internet program, now in it's 10th year, provides project based learning as well as a strong mentorship component bringing students online daily for math, science, history and reading studies. Using advanced technologies such as GIS (we give GPS units along with a variety of other learning tools to each classroom at the beginning of each year), video chatrooms and personal electronic student portfolios Camp Internet provides an environment for both teachers and students to learn and develop technology skills essential for the 21st Century. Subject experts from universities, federal and state agencies as well as well as authors, musicians and artists come online weekly as "trail-guides" to give the students direct contact with the sources of their information. Chatrooms are used to teach students skills in "dialog", learning to listen, ask good questions and then report on the question and answers. Current programs include "Exploring the California Channel Islands", "Exploring the California BackCountry", Exploring the Ancient Southwest" and "Exploring the Global-Garden". Camp Internet is also responsible for ongoing Teacher Technology training for all of our school districts, providing 4 day intensive training sessions during the summer at our Technology Center in Santa Barbara , California and ongoing teacher training at school district labs throughout the year. (we train around 400 teachers each summer). Our paper will review recent activities and results in teacher training and methods used as well as a review of current classroom activities and results from the past year. Camp Internet was just awarded its 5th USDA Rural Utilities Service distance learning grant to take the program into the southwest opening the program to schools in Arizona, New Mexico, Colorado and Nevada. Working with the California State University system Camp Internet also provides credit to teachers taking part for a full year as well as a $1,000 stipend. Participating classrooms receive cd-roms each month with new GIS, math and video units to encourage participation by schools which may have limited bandwidth. The Camp Program also works with the CYFAR program setting up programs for youth, family and children at risk projects and provides an excellent study in the application of new technologies to parts of our communities with limited literacy or limited English language skills. Our paper will provide current updates on both Teacher Technology Skills training methdologies and classroom programs.

The virtual library. A new approach to knowledge through Internet

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Objective: Opening of a new space to pedagogical development in order to facilitate the interaction among teachers, students and knowledge.

Methods: The mentioned objective was accomplished by means of a new space which allows the access to Internet free without restriction by means of an optical fiber connection. Such a space is called a Virtual Library. In this space students and teacher from the Faculty of Biochemical and Pharmaceutical Sciences including future Biotechnology Licentiates, may use ten personal computers, which maintain a permanent connection to Internet. All users search for information regarding different topics which are in the field of their respective interest including for example the access to international databases related to specific topics as protein sequences, which were not possible to perform formerly in this Faculty. In addition, the users can establish contact with people from other World universities by mean of e-mail or chat; they can get access to web pages or archives as well as to other service which are offered through Internet. Advanced students from System Analyst career that belongs to J.J. de Urquiza Institute of Rosario supports and brings information to the users. Such a multidisciplinary interaction not only increases web use by people from the Faculty but also improves teaching experience and knowledge appliance of future System Analyst. A cooperation agreement was signed between the Faculty and the Institute to provide necessary lawful support. This project started in March 2000. Actually about 48 teachers and 682 students are registered as users of the Virtual Library. It was statistically calculated that users are web navigation during two thousands hours a month. This project is at present of regular use by teachers that provide also a Virtual Class to the students. Next November will start the first postgraduate course through distance by e-mail, which is offered through the Graduated School of the faculty of Biochemical and Pharmaceutical Sciences. Such a course has the purpose to provide an intelligent use of new technologies to new graduates in Biochemistry and Pharmacy.

Conclusions: This experience considerably increases fields of knowledge not only to students but also to teachers within an academic environment that allowing both professional and personal enrichment. This model should be adopted by other academic institutions as a regular offer.

Multiplicity & Flexibility as Web-Based Collaborative Learning Course Design and Implementation Considerations – A Case Study

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Abstract: This presentation examines how multiplicity and flexibility were essential considerations in the design and implementation of an award-winning Web-based collaborative learning course. Design features supportive of multiplicity and flexibility are examined, as are implementation and assessment processes employed in meeting these goals. Future online collaborative learning course design and research implications are discussed.

Introduction

The Internet has created opportunities for widespread electronic delivery of news, information, and curriculum that have altered the ways we communicate, share knowledge, deliver education, and conduct business. It also provides unique opportunities to prepare learners for "future responsibilities" and "success in life," as well as tailoring instruction to meet individual learner's needs and interests while drawing strengths from students' diverse backgrounds (Dewey, 1938, p. 17).

A case study of a Web-based course that integrated computer-supported collaborative learning is used to illustrate the importance of multiplicity and flexibility as key elements in designing collaborative and interactive online learning environments. This study describes the course context, objectives, and structure of an award-winning Web-based collaborative-learning course, Instructional Technology Planning and Management (ITPM), offered in the spring of 2001 at the University of Texas at Austin. This course received the "National Distance Learning Course Award" from the University Continuing Education Association, and the instructor received the "2001 Excellence in Distance Learning Teaching Award for Higher Education" from the U.S. Distance Learning Association.

Multiplicity refers to the multiple ways of presenting and delivering course material and providing multiple channels of communication, interactive activities, and learning strategies. Flexibility refers to the provision of choices to learners in designing a learning environment more responsive to their needs and interests. Such an environment characteristically invites questions and suggestions, provides timely support and options for learning tasks, rich readings and interactive assignments, while providing ongoing individualized feedback.

This paper examined multiplicity and flexibility in the design, implementation, and assessment of an online course that emphasized collaborative learning. Essential features of multiplicity and flexibility discussed include: multiple course representations, tools, communication types and channels, support, interactions, flexible course structure, personalized communication and feedback system, and cultural-sensitivity to better meet the needs of learners from diverse backgrounds.

Study Summary

Based on the researcher's experience in course design and implementation, multiplicity and flexibility emerged as important factors in meeting the needs of learners from diverse backgrounds. This study examined an online course, ITPM, offered to both on-campus and distance learning students. This course was situated in a virtual environment where students met through both asynchronous and synchronous online interactions. The major intellectual product developed by the students was a strategic technology plan collaboratively produced as students learned the basic concepts and tools of strategic planning. The course was comprised of eight modules, each representing a major component of the planning process. Modules progressed from simple to complex tasks.

Four aspects discussed in this paper include: course content and structure; course delivery; social interactions and support; and course evaluations. Multiplicity was represented in the course content and

structure by providing rich information, resource links, reading selections, activities, and assignments. The course emphasized cognitive, social, and technical aspects of learning. Most assignments and activities were group-oriented where interaction was essential. A dedicated group discussion site provided students a platform for social interactions. Although most communication occurred asynchronously, the planning teams also made significant use of synchronous communications. Collaborators chatted, asked support staff for assistance, discussed tasks, and socialized with peers in real-time.

Multiple tools were employed for various task purposes, while multiple media were employed for course presentations (text, graphics, streaming video, video-conference, audio-conference) and for group interactions (e-mail, phone, voice mail, synchronous chat line, audio and video-conference, and face-to-face interaction for on-campus students). In considering technical failures, the course content was available at multiple Web sites. In considering accessibility, a CD-ROM of streaming video segments was made available free of charge at the beginning of the semester. This enabled students with low-bandwidth connections to easily access all video and audio elements of the course. The multiple ways of presenting course material and the multiple platforms for providing course content not only increased learners' interest options but also provided flexibility in the event of technical glitches. The multiple channels available for learners to approach the instructor, support staff, and other students provided options and alternatives for flexible communication.

Course design was the result of a collaborative effort among a team of diverse backgrounds. Likewise, student support was organized around a collaborative group effort. Learners were able to obtain assistance from an array of sources, including the instructor, the teaching assistant, a technical staff, an administrative coordinator, a network administrator, and two subject-area consultants. Multiple sources of support were available via an online weekly newsletter, handbook, and announcements, technical support, and consultants' areas. The teaching assistant monitored group activities daily and provided timely instructional and technical feedback to learners.

Multiple types of assessment were employed to maintain student accountability in achieving individual and group learning goals. These included the instructor's evaluation, learners' self-evaluation, peer evaluations,, and group product evaluations, as standardized by evaluation rubrics provided in the course content. Learners evaluated themselves and their teammates by two methods: rubric-based ratings and qualitative comments based on individual judgments.

Evaluation of individual student's progress was based on cumulative monitoring, analysis, and feedback of students' online participation (self, peer, and product evaluation results), as well as their frequency of communication and quality of their contributions. To keep learners abreast of their progress, descriptive written or voice feedback on learners' performance and future assignment deadline reminders were provided at the end of every module.

Conclusion and Future Implications

Multiplicity and flexibility were incorporated as design features in order to approximate the complexity of real world contexts where multiple solutions collaboratively arrived at are the norm. Incorporating multiplicity and flexibility into the design involved providing multiple ways of presenting and structuring content, providing multiple communication channels, providing choice of readings, learning resources, assignments and task, and providing flexibility for learners in working collaboratively to accomplish learning projects and solve problems. There were also constraints in the application of multiplicity and flexibility. For example, the course start and end dates were fixed by the university calendar while the intensive time constraints required fixed deadlines for completion of specific learning projects and tasks. Given the pressing need for online instruction that is responsive to the needs of individual learners, further research into the use of multiplicity and flexibility as design features of the distant-learning environment is warranted.

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Lessons Learned from Facilitating a Web-Based Professional Development Course for In-Service Teachers

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Abstract: The purpose of this paper is to share the lessons learned from facilitating a Web-based professional development course for K-12 educators. Offered in Spring 2001, *Using the WWW in the K-12 Classroom* was the pilot course of a newly developed Professional Development Series offered by a university located in the Appalachian region. The course facilitators were an assistant professor at the host university and a part-time faculty member who lives in California. The shared experience of facilitating a course at a distance brought up many issues about the role of the instructor and communication between instructor and student. The instructors intend to share their reflective study of these issues and other lessons learned to provide further insight into successful facilitation of Web-based distance education courses.

Overview of the Course

A total of 153 in-service teachers were enrolled in the 10-week, self-paced course titled *Using the WWW in the K-12 Classroom.* The four main objectives of the course were for teachers to improve their Web searching skills, collect Web resources relevant to their grade level and content area needs, explore methods for integrating Web resources into their planning and instruction, and develop a basic Web page.

The course was developed using WebCT and included email and bulletin board communication tools. Course content was presented in six modules, each with accompanying assignments such as participating in bulletin board discussions, responding to reading and reflection questions, and creating a Web page. The course was graded on a Satisfactory/Unsatisfactory basis, with 80% required on each assignment to receive a passing grade.

Lessons Learned

Instructors

One of the most notable aspects of teaching a Web-based distance education course is the communication between the instructors and course participants. The instructors noticed rather early in the course that their written responses to students were more formal than those they would typically make in a face-to-face course. For example, instructors noted that in providing feedback on assignments, they often began by writing "Thank you for submitting your assignment." The instructors constantly reflected on the heightened sensitivity they used in communicating with participants. A concern about loss of inflection and tone in written communication meant that instructors spent a lot longer composing written messages than they would composing a verbal response to a student in a face-to-face course.

Instructors also faced the unique challenge of using the technology to teach about technology. To facilitate the nature of a self-paced course, the instructors were restricted to using asynchronous communication tools to help participants troubleshoot Internet-related problems. Because part of the course was focused on developing Web

design skills, instructors found that often communicating at a distance posed a challenge for effectively communicating how to use the technology.

Other lessons learned were related to course development and the role of the instructor in a Web-based distance education course. Some of the issues that arose during the course are discussed below.

Initially, the instructors planned to divide the teaching load by alternating weeks for which they would be responsible for facilitating class discussion, grading assignments and responding to questions. Recognizing that participation was slow in the early weeks of the course, the decision was made to divide responsibilities by module so that one instructor was responsible for monitoring discussion, assignments, and questions for some of the modules and the other instructor was responsible for the remaining modules. This also allowed for greater consistency in grading individual assignments and made things less confusing for students who needed to submit corrections.

Instructors found that including an orientation module that served as an overview of the course and an introduction to the WebCT environment facilitated participants' comfort level with communicating by bulletin board and private mail, both of which are skills required for successful participation in the course.

While all course participants received feedback on their work, the instructors noticed that participants who submitted assignments early in the semester were more likely to receive in-depth feedback.

Instructors were challenged to find ways to make essential components of assignments more prominent for learners who did not read assignments carefully.

Keeping track of participants' assignments and revised assignments was a challenge. Midway through the course instructors asked participants to send a private mail message indicating that they had completed an assignment or were submitting a revision. This facilitated the tracking of assignments.

Participants

The types of questions participants asked and the general quality of their assignments suggested that more specific guidelines and examples were needed to support them in completing assignments successfully.

Participants had a desire to be connected by grade level and/or content area. Some participants "found" each other by reading introductions posted to the bulletin board. Others wanted the instructors to make the connections for them.

Some participants required more personal interaction with the instructors and called the university to ask for specific help over the telephone. The number of calls increased toward the end of the semester.

It became apparent when reviewing assignments that all participants did not thoroughly read the course content and directions. Informing students that an assignment was incomplete or unsatisfactory accounted for a large number of the private mail messages instructors sent. Looking for a pro-active way to address this situation, the instructors developed eight tips for successful participation in an online course, which is now included with participants' registration packet.

When posting assignments to the bulletin board, participants tended to follow the pattern of the first posting. Subsequently, the first posting set the stage for the quality of the discussion. If the first posting was well constructed and thorough, those that followed tended to be of high quality as well. On the other hand if the first posting was incomplete or poorly constructed, subsequent responses tended to follow that pattern. In the first case, the instructor was less involved in facilitating the discussion, as it tended to be participant-led, in the latter case, the instructor was more involved in order to increase the quality of the discussion.

Although the course syllabus indicated that instructors would respond to private mail and bulletin board postings within 48 hours, participants had a need for immediate feedback. Self-grading components that were automatically scored by WebCT seemed to make participants impatient for feedback on other assignments.

Conclusion

Facilitating an online course is both challenging and rewarding. What the instructors of this course discovered is that the challenges have as much to do with the technology and course design as they do with the interaction between instructor and participant. This reflective study of two online course facilitators is important because the lessons learned are instructive to other online facilitators. It is also important because the lessons learned were used to make revisions to this and subsequent professional development course offerings.

COPYRIGHT AND FAIR USE: BLIND MEN DESCRIBING THE ELEPHANT

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Abstract: The "fair use" of documents secured from the Internet for educational use has historical precedents dating back centuries. Indeed, the concepts of ownership of intellectual property have been sharply debated since the invention of movable print. Fair use can be defined based on the purpose, nature, and amount of material accessed, and on the economic impact of the use of the material. Various scholastic organizations have implemented policies to define fair use and to make the Internet useful to scholars, but fair to the authors of documents. New technologies are now available to ensure copyright compliance.

Much is written on the various laws and regulations concerning the educational "fair use" of copyrighted material from libraries, the Internet, and a host of other sources. From issues of historical precedents, to ownership of the source material, to recent statutes, to myth and innuendo, fair use is defused through different filters to be different things to different practitioners. Authors describing "fair use" will emphasize isolated aspects of this doctrine, similar to the poem of blind men describing different parts of an elephant (i.e., the tail is like a rope, the ear is like a fan, etc.). We notice what seems most obvious and visible from our limited perspectives.

The problem of copying the work of another author goes back a few hundred years. Goehner (1997) suggests that the very invention of the Gutenberg printing press created the opportunity to steal the written word, what with the newly-found ability to mass-produce documents.

McLaughlin (1999) suggests that recently enacted regulations are nothing new at all, but rather they are more in keeping with eighteenth century Germanic states that enacted laws to protect the author and publisher of a work. Apparently, the typical book or pamphlet would be copied again and again despite the author's wishes. McLaughlin cites eighteenth century philosopher Immanuel Kant who said, "....The counterfeiter undertakes the author's business, not only without any permission from the owner, but even contrary to it" (Kant, 1795).

The very act of accessing an Internet website causes a copy of the web page accessed to be placed on an end user's system (Lipinski, 1999; McLaughlin, 1999). This aspect of "fair use" allows for "browsing" in the digital environment, even with a copy in the computer's RAM (Lipinski, p. 13).

After describing the extent of the Copyright Act of 1976 and what constituted a copyrightable work, MacKnight (2000) defines four factors within the law which are " . . . not specific on what is or isn't 'fair use' " (p. 110). The *purpose* of the extracted work, e. g. research, teaching, scholarship, has to be considered. The *nature* of the copyrighted work, whether it is creative, or factual, or whether it has been previously published determines its fair use. Unpublished materials and creative works are more likely to be denied fair use. The *amount* of the work extracted varies with the work. The *effect* on the potential market must not harm the author's opportunities for sale of the work.

A major state flagship university system has developed easily readable "rules of thumb" for not only determining the "fair use" of an Internet document, but also making "course packs," images, music, multimedia, distance learning, research copies of articles, and holding materials on "reserve" status in the library (University of Texas System, 2001).

Templeton (1998) lists his "top ten" myths about copyright on the Internet. Templeton's discussion about those "myths" indicates that even our e-mail is copyrightable. The inference is that although some works are copyrightable, the marketability of those works is virtually zero. What could we charge folks for reading our e-mail or Usenet postings? The "myth" of educators being immune from copyright is gone. The ideas that "they can't sue ME," and "I have rights" vanish when the reality is that litigation stemming from a copyright violation is CIVIL, rather than criminal, and the rules are startlingly different.

Financial issues dominate other authors' concerns over copyright and ownership of Internet products. Smith, Eddy, Richards, and Dixon (2000) insist that copyright law and litigation over intellectual property rights will be arenas of significant risk as educational institutions become providers of Internet education. They suggest that anti-trust regulations could be construed to include educational institutions "if they acted with commercial motive" (p. 6). Smith, et al. suggest that universities might be somewhat behind in the establishment of policies to address possible anti-trust litigation. (p. 11)

Admitted Luddite David Noble decries the proliferation of Internet courses for profit by universities (Noble, 2000). Noble insists that the professors (authors) who create courses (works) have a right to own their course material and that the university has no right to profit from the creative work of professors. Simpson and Turner (2001) report on methods one university has implemented on assigning ownership of intellectual material based on a professor's usage of university time, university resources, the professor's job description, and the number of students involved (University of North Texas, 2000).

Lipinski (1999) argues that "fair use" is also a key factor in distance education. He maintains that current laws be augmented to allow for the various problems related to distance education, e. g. access to materials. Moreover, the current laws correctly indemnify libraries, etc. from liability if they have taken some array of safeguards to prevent document piracy. Lipinski suggests that new technologies, such as watermarking documents, printing denial, and tracking be employed for copyright management.

The motivation for this present research stems from discussions among peers on just what "fair use" is, how it works, how it is implemented, and how much we can demand from both faculty and students as to compliance. Hopefully, this present paper will be expanded for greater depth. How we as practitioners, and our students, who will in turn influence even more students, deal with this will make the difference as we implement technologies and delivery systems yet to be conceived.

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The Role the New Opportunities Fund 'ICT for Teachers' Initiative has Played in the UK, Drawing on the Experiences of SIfT, an Approved Training Provider to the Scheme

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Abstract
This paper outlines the role played by the New Opportunities Fund (NOF), 'ICT for Teachers' initiative in the UK. This Government scheme, which commenced in April 1999 (TTA 1998), provided a sum of money for every serving teacher in the UK, to 'buy' professional development training in ICT (Information and Communications Technology), from Government Approved Training Providers. SIfT (1999) as a provider to the scheme, has developed pedagogically sound learning materials (TTA 2001a), addressing the needs of individual teachers, delivered through a Virtual Learning Environment. We believe that the results, issues, experiences and questions arising from our research have implications for researchers all over the world. Indeed with the SIfT training in the main delivered via the Internet, the international aspects of delivering training for teachers by this medium is continuing. SIfT materials are currently being used by in excess of 1000 teachers, in England and Jersey, have been trialled in Norway and are being used in Germany.

Introduction

The *Stevenson report*, published in the UK in 1997, identified that "*The Government must launch a long term strategy to increase the effective usage of ICT in schools*". With respect to teacher support, it identified "*The overall aim should be radically to improve and accelerate the skills, experience and confidence of teachers so that they can use ICT to facilitate learning*" (Stevenson 1997).

In response to this report, the Government established one of the largest training schemes for 'serving' teachers in the UK - the New Opportunities Fund (NOF) *'ICT for Teachers'* initiative (TTA 1998), which it supported with £230 million from the national Lottery. The aim of this current scheme is to facilitate the national targets set by the Government, for all teachers to be ICT (Information and Communications Technology) confident and competent to teach using ICT, by the year 2002 (DfEE 1997). The focus of the training is to help teachers to use the technology within their *subject area* of the curriculum, rather than teaching purely how to use the technology.

Staffordshire ICT for Teachers (SIfT), a collaboration between Staffordshire University and Staffordshire Local Education Authority (LEA), in the U.K. became a Government Approved Training Provider in February 1999, following the competitive tendering process (Whitehouse *et al.* 1998). SIfT was approved as a national provider for England (one of fifty approved providers) to deliver ICT training to secondary teachers (of students aged 11-18), within the subjects of Geography and Design and Technology (SIfT 1999).

SIfT planned to deliver the majority of their training to teachers, using a web-based Virtual Learning Environment (VLE), in this instance Lotus Learning Space. A Virtual Learning Environment is defined as "*an integrated software system, which combines within a package facilities for the delivery of learning materials, communication (synchronous or asynchronous), assessment and student feedback*" (LTSN/THES 2001).

The SIfT aim was to create a 'virtual' learning solution, which:

- utilised technology to support the strengths of human contact;
- made the technology available so that teachers had the opportunity to learn with interesting and lively experiences of ICT, in a subject context which was familiar to them;
- offered the opportunity to learn mainly within the teachers own physical environment, enabling the 'learning on demand - any time, any place, at your own pace' style of learning.

This paper gives a high level view of the SIfT model, covering: materials and delivery; the relevance of the tasks set; support given; the sharing nature of the resource base; and the networking and discussion opportunities. It explains the design of the SIfT 12 Unit grid and the issues of pedagogy that were addressed, reflecting on how timeframes drove the development and how feedback, both from teachers and the Teacher Training Agency quality assurance process, improved the model. Finally the paper evaluates the SIfT provision, drawing on evaluation evidence published on both the NOF '*ICT for Teachers*' scheme and the SIfT training, commenting on the impact of SIfT and the current on-going research.

Development of the SIfT 12 Unit Grid

The design adopted by SIfT was to create a highly structured model, subject focused to the perceived needs of the users (Milligan 1999). The SIfT training was developed as a 12 Unit grid, consisting of four subject strands, each with three levels of ICT capability - beginner, intermediate and advanced. This grid was then implemented for teachers at secondary level (with students aged 11-18 years) for the subjects of Geography and for Design and Technology.

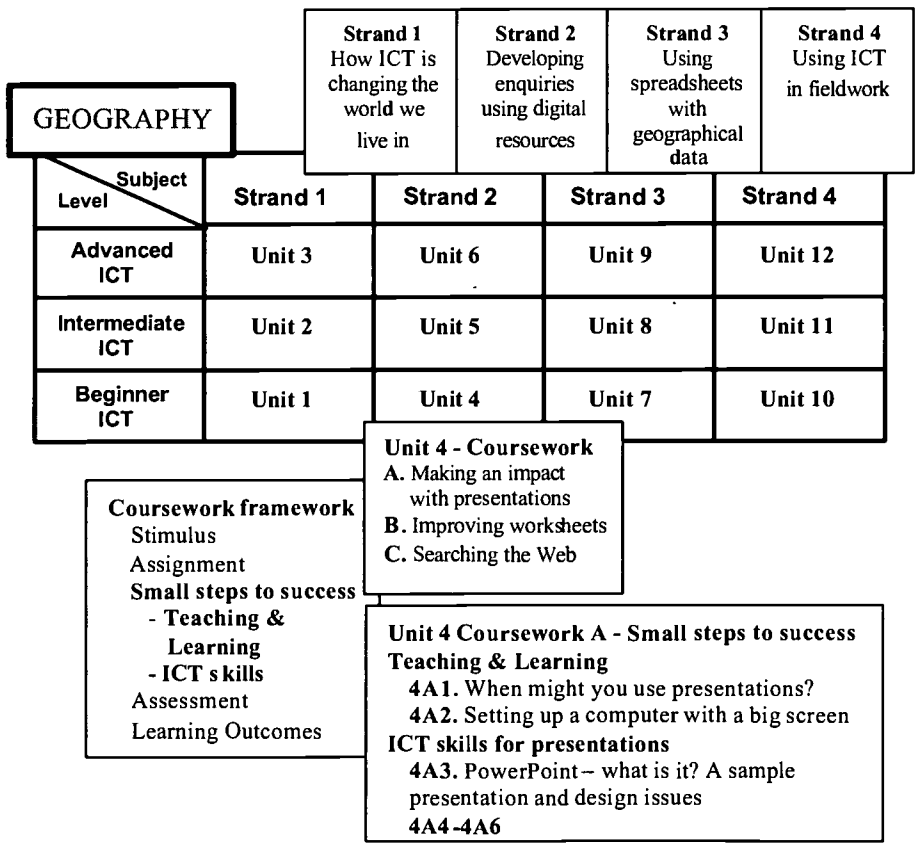

Figure 1: the SIfT model, illustrated for Geography © SIfT 1999

Figure 1 shows the implementation of the SIfT design for Geography. The four subject strands are: 'How ICT is changing the world we live in', 'Developing enquiries using digital resources', 'Using spreadsheets with geographical data' and 'Using ICT in fieldwork'. Each of these strands is offered at 'Beginner', 'Intermediate' and 'Advanced' level of ICT competence, resulting in twelve units in all, numbered from 1 to 12. The Unit is broken down into two or three Courseworks, identified as 'Coursework A', 'B' or 'C', each with a common framework of 'Stimulus', 'Assignment', 'Small steps to success', 'Assessment' and 'Learning Outcomes'. The 'Small steps to success' are the learning tutorials within the Coursework, which provide the materials for the learner to develop the knowledge and skills to be able to carry out the 'Assignment'.

Under the *ICT for Teachers'* scheme, funding is available for teachers to 'buy' four units from a possible twelve, thus providing flexibility for teachers to choose the SIfT units, which most closely reflect their ICT competence level and subject need. A teacher selecting Unit 4 and commencing on Coursework A 'Making an impact with presentations', would thus follow the 'Small steps to success' tutorials, identified consecutively as 4A1-4A6, to cover materials in the areas of 'Teaching and Learning' and 'ICT skills for presentations'.

The SIfT 12 Unit grid and framework were particularly suited to the 'Content Centred' Virtual Learning Environment (Milligan 1999), of Lotus Learning Space (LLS) Version 2.5, which was used for this development. LLS had been acquired by Staffordshire University in December 1997 and had been used by local students from September 1998. Within LLS, the student encounters four main areas - the 'Schedule', 'MediaCenter', 'CourseRoom' and 'Profiles'. The Schedule holds the *outline of the virtual course*, whilst the MediaCenter holds the *course-related material.* The SIfT Units and Coursework framework would thus be accommodated within the Schedule area of LLS (Stimulus, Assignment, hyperlink headings to the Small steps to success, Assessment and Learning Outcomes), whilst the SIfT Small steps to success tutorials would reside within the MediaCenter. Of the remaining LLS areas, the CourseRoom would permit on-line discussion, collaboration, assignment creation, submission and feedback, whilst the Profiles area would enable participants to submit their own personal information, relating to their education, experience and interests.

In creating the SIfT learning content within the VLE, the aim was not only to produce 'bite-sized' pieces of learning (taking no more than 30 minutes elapse time), but also to provide material which was pedagogically sound, incorporating qualities of the 'virtual tutor'. The objective was to create material, which was motivational and friendly, innovative, lively, interactive and dynamic, and to place special emphasis on understanding and accommodating the many requirements of the teachers' daily needs.

SIfT Pedagogy

Gagné (1985) identifies nine events of instruction for any desired learning, (see Table 1). These instructional events provide the external conditions that are necessary for learning to take place; the events usually occur in the order listed. Within the SIfT Coursework materials, Gagné's nine events of instruction are developed within the Stimulus, Assignment, Small steps to success, Assessment and Learning Outcomes, and are explained here in the context of the SIfT Geography materials.

1.	Gaining attention.
2.	Informing the learner of the lesson objective.
3.	Stimulating the recall of prior learning.
4.	Presenting the stimulus material with distinctive features.
5.	Providing learning guidance.
6.	Eliciting performance.
7.	Providing information feedback.
8.	Assessing performance.
9.	Enhancing retention and learning transfer.

Table 1: Gagné's nine events of instruction

Stimulus
The aim of the Stimulus is to *gain the teacher's attention* (Gagné's instructional event 1). The SIfT Stimulus uses a goal-based scenario, to set the scene of the learning and to motivate the user. Within the subject of Geography, the stimulus may be delivered through a scenario, which could be surprising, emotional, a mystery, a conundrum or paradox, something confusing, fun, dramatic or moving. Geography, Unit 4, Coursework A – 'Making an impact with presentations', begins with the use of presentational slides containing images of the Colombian Earthquake, February 1999 and makes the statements "Imagine you lived here" and "Think about how these people feel".

Assignment
The Assignment *informs the teacher of the lesson objective* (Gagné's instructional event 2) "Your task will be to follow the instructions carefully to create a presentation to start a lesson with a whole class or a small group...."

Small steps to success
The Small steps to success are the tutorials. In *stimulating the recall of prior learning* (Gagné's instructional event 3), the SIfT materials provide a selection of geography lesson scenarios and the question is asked "Which of these are genuinely enhanced by using a presentation?" The teacher may call on the tutor's opinion or knowledge base (revealed through a hyperlink), to *provide learning guidance* (Gagné's instructional event 5). This guidance uses images to further illustrate the impact of slides to deliver the required message, thus *presenting the stimulus material with distinctive features* (Gagné's instructional event 4).

The SIfT Small step tutorials provide content which may be re-used, immediately by teachers themselves, within a classroom situation. The steps include humour and focus directly on the teachers' needs, their problems and environment. Step 4A2 'Setting up a computer with a big screen' commences with the words "This tutorial may be NO USE AT ALL". If the school does not have the projection facilities, it pre-empts any negative teacher response, which may have been directed at the SIfT materials, creating instead an empathy with the SIfT team who understands their circumstances. Whilst working through the tutorials, if the teacher experiences difficulty or requires clarification, access can be made to an on-line mentor through the LLS CourseRoom, for further learning guidance (Gagné's instructional event 5). In providing support, SIfT are responsive to teachers' questions, encouraging the teachers, sharing thoughts and returning a little more information than requested – using our own awareness of new ideas.

Assessment
Whilst the Assignment informs the learner of the lesson objective (Gagné's instructional event 2), the teacher implements their new ICT knowledge and ideas, in a way that is relevant to them within their school – usually in planning an appropriate piece of teaching and learning. This can be semi-negotiated with a SIfT tutor (Gagné's instructional event 5) if the teacher wishes, via the on-line CourseRoom. The opportunity for the teacher to 'Request for Review' work which is in progress, enables the tutor to *elicit performance* (Gagné's instructional event 6) and to *provide information feedback* (Gagné's instructional event 7) on how to improve their lesson assignment.

The assessment is further developed by the application, of the ICT materials created, within the teachers' own educational context and the completion of the Plan, Teach and Review pro-forma within the Assessment area. The teacher is asked to reflect upon the context of the teaching and learning in which the ICT was utilised, the actuality of their delivery, its success and opportunities for improvement. The teacher then 'Submits for Grading' their ICT materials and their Plan, Teach and Review pro-forma, via the CourseRoom of the Lotus Learning Space software, to receive further feedback (Gagné's instructional event 7), and to receive *assessment of performance* (Gagné's instructional event 8). This application of the teachers' learning within their working environment and their reflection upon it, serve to *enhance retention and learning transfer* (Gagné's instructional event 9).

Learning Outcomes
The Learning Outcomes provide the user with a clear identification of the stage that their learning has reached at the end of the current piece of Coursework. "On completion of Unit 4 Coursework A you will be able to: Critically appraise the potential uses of presentations in teaching geography.....".

All of Gagné's nine instructional events are thus developed within the SIfT materials, providing a strong pedagogical design, implemented through the SIfT 'virtual tutor' model.

Evaluation of SIfT and the NOF *'ICT for Teachers'* initiative

With the launch of the SIfT training in January 2000, the NOF initiative did not permit time for research of best materials. SIfT adopted an iterative practise to development, prototyping the materials and subsequently reacting to feedback from teachers, integrating suggestions and new ideas within the content. Further development occurred in 2001, following quality assurance by the Teacher Training Agency, of the SIfT model and materials.

A day of face to face training introduces teachers to the VLE and SIfT materials. The central focus of SIfT is then on classroom practice, the training materials illustrate a range of classroom approaches with critical evaluation, developed through various learning styles. The product of the teachers' work is created within the VLE CourseRoom, building the resource base for others, with individuals able to download and use other teachers' endeavours. SIfT believes that as the system grows and more and more teachers add assignments to the system – teachers will consolidate their experience by using the products of other people's work, further enhancing retention and learning transfer. It is the opinion of the SIfT team that a flexible delivery strategy for a Virtual Learning Environment has been created, developed, and tailored to individual needs and which is scaleable (Milligan 1999). Currently in excess of 1000 teachers are registered users of the SIfT secondary Geography and Design and Technology materials in England, Jersey, Germany and Norway.

The Teacher Training Agency (TTA 2001a) said of SIfT: *"The model is actively chosen by schools, mainly because of it's subject specific nature and networking potential. The programme is well constructed and connected, with all the required elements covered. .....The elements of each unit within the modules are well constructed to form a complete whole that provides for a diversity of initial ICT ability and teaching experience...*This strong subject provision focus, adopted by SIfT, has not always been present in training offered by some providers (TTA 2001b) and as a result led the Office for Standards in Education (OfSTED 2001) to identify that such training was less effective in raising teachers' *confidence to use ICT.*

The training has increased teachers' *use of ICT resources* to enhance subject teaching, aid communication and share good practice (TTA 2001b). Whilst OfSTED (2001) also found that the NOF training programme had contributed to an increase in the use of computers, they said it had rarely contributed to the pedagogic expertise to help teachers make the most effective use of ICT in their lessons. This is in contrast to the SIfT delivery, where the TTA (2001a) found: *'The delivery of the programme places emphasis on the development of pedagogical related issues. The material and structure of the training can facilitate the development of significantly advanced pedagogical thinking and extend the use of ICT within the school."*

Although the TTA acknowledges that the SIfT materials are broad and comprehensive, appropriately supportive and generally accessible, they identify that *"there is evidence that teachers with minimal or no experience of the Internet will not make the maximum use of the materials ...it leaves a number of teachers feeling overwhelmed and disempowered in taking responsibility for their own learning."* The SIfT team are aware of the many difficulties that teachers face and through their research are endeavouring to create further support mechanisms.

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Anchored Collaborative Inquiry

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Abstract: This paper describes Anchored Collaborative Inquiry, a model for in-service professional development that combines a traditional face-to-face workshop with online discussions in which teachers compare simultaneous implementations of the same reform-oriented curriculum. Tests of the model indicate that although the shared context encouraged teachers to participate much more than was required for course credit, they often failed to engage in a sustained dialog or to provide descriptions of their classroom implementations that would allow facilitators and peers to respond to their reports.

Recent discussions of in-service teacher education call for ongoing experiences that take part in the context of teachers' own practice (Cochran-Smith & Lytle, 1999; Franke et al., 1998). These experiences are expected to take the place of the often-maligned in-service workshop and lead to learning that is flexible, self-sustaining, and generative (Franke et al, 1998). The call for situated teacher learning occurs at the same time that the Internet and World Wide Web are making possible numerous opportunities for online professional development (Goldman, 2001). Little is known about how teachers use these opportunities and the effects they have on teachers' practice. This paper presents an example of extending the impact of traditional professional development through the use of ongoing computer conferencing to promote teachers' reflection on their practice.

Our model for professional development is called *Anchored Collaborative Inquiry (ACI)*. *ACI* is based on anchored instruction, an approach developed over the last decade by the Cognition and Technology Group at Vanderbilt (CTGV, 1997). The enduring idea behind anchored instruction is that sustained exploration of realistic, meaningful problems leads to learning that is highly valued and likely to be used when needed. In the *ACI* workshop teachers explore ways of teaching a reform-oriented curriculum (CTGV, 1997). Then each teacher implements the curriculum in his/her classroom simultaneously and discusses the results of the implementation online. As they engage in this dialog with peers, teachers attempt to make sense of what is occurring in their implementation and to enhance their understanding of how students learn to solve complex problems. In our model, professional development includes 1) Face-to-face meetings to learn about a reform and collaboratively plan for implementation, 2) individual implementation in each teacher's classroom, and 3) shared reflection via an online conferencing system during the implementation.

Previous research on professional development that takes place completely online indicates that a sense of community forms slowly and face-to-face meetings can be helpful in overcoming a sense of isolation (Goldman, 2001). Face-to-face meetings can also contribute to a sense of trust among participants essential for those engaging in challenging, long-term tasks. Participants without a sense of trust are more likely to be guarded in their responses and less likely to engage in a critical examination of their assumptions. On the other hand, participants who know other participants are more likely to be interested in what their colleagues have to say and to feel an obligation to continue the discussion.

While traditional face-to-face workshops may lead to development of a sense of community, they lack the ongoing interactions with colleagues and coaching in teachers' classrooms thought to be necessary for effective professional development (Putnam & Borko, 1997). This type of long-term support is time intensive and difficult to implement on a large scale; however, it may be facilitated by online interaction. The *ACI* model combines facilitated face-to face and online discussions to enhance teachers' understanding of reform-oriented teaching. In the following paragraphs, we summarize the results of tests of the *ACI* model.

Findings

Teachers need personally relevant activities to encourage interaction in online learning communities. Tests of the *ACI* model suggest that teachers' sustained and active participation in the online conference was related to the shared context established by the workshop experiences and the simultaneous implementation of the reform curriculum. Teachers were very goal-oriented in their use of the online conference. They did not use the forum to initiate social conversations or to engage in professional discussions that were unrelated to the implementation; however, the number of postings was over twice what was required for course credit. Likewise the number of replies to these posting was approximately twice the requirements. Thus in the *ACI* conference, it appears that teachers were responding to a specific learning goal rather than an opportunity to discuss general issues.

Access to descriptions of events in participating teachers' classrooms are critical for facilitators and teachers to carry out collaborative inquiry online. Typically researchers and teacher educators regularly observe in the classrooms of collaborating teachers. In our project, all participants were completely dependent on the descriptions of the dassrooms provided by the teachers themselves. Adequate information was difficult to obtain from our teachers for several reasons: First, they were unaccustomed to articulating how they knew students were learning and what they were learning. Second, they lacked experience in implementing the reform and may have failed to notice and report important events. Third, text descriptions of classrooms are difficult to create and time-consuming to type. Teachers may have lacked the time and writing skills necessary to create rich descriptions.

Participants in online collaborative inquiry need to be able to carry on a sustained dialogue in order to discuss ideas and integrate information from others into an understanding that grows and develops. Only one-third of teachers' postings during the implementation phase of our conference were replies to a previous posted message. The others were disconnected reports of various aspects of the implementation. It is possible that teachers (and learners in general) are not accustomed to carrying out an extended dialog about a single idea, i.e., following an idea from its initial statement to some kind of conclusion (Wilson & Berne, 1998). This kind of interaction was more likely to occur during the face-to-face part of the *ACI* model than online. Developing this type of interaction is likely to be a difficult learning goal and is likely to significantly extend the amount of time required to establish a productive learning community.

Professional development that attempts to change teachers' beliefs and practice requires a fundamentally different kind of interaction than researching resources, communicating with parents or colleagues, or other ways that teachers use online communication. Online discussion was successful in extending support to teachers separated by distance from professional development personnel and in encouraging teachers to reflect on their practice in the context of this reform. However, online professional development rooted in teachers' own practice requires some means of sharing what is happening in the classroom with those online. Significant preparation and experience will be necessary to enable teachers or other participants in online learning communities to develop the skills to describe the settings in which they are learning and working and to develop a culture where this type of sharing is the norm.

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THE GUIDING ASSUMPTIONS OF SUCCESSFUL DISTANCE EDUCATION PROGRAMS

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At its core, distance education is a change process, not a delivery system and historically higher education culture has proven resistance to change. Perhaps the greatest benefit of distance education is its potential role as a catalyst for adapting the way educational institutions do business. In a relatively short span of years, the proliferation of programs and services available at a distance have resulted in a heightened sense of competitiveness unheard of in higher education. For institutions that are up to the challenge, the current interest and growth in distance learning presents a new opportunity.

In a few short years, distance education and its off-spring (e.g., web-supported instruction, videoconferencing, etc.) have been transformed from a quaint irrelevancy to a lightening rod for change on many university campuses.

Sherron and Boettcher (1997) suggest that the current rush to implement distance learning programs by colleges and universities is occurring for three major reasons:

- The convergence of communication and computing technologies,
- The need for information age workers to acquire new skills without interrupting their working lives for extended periods of time, and
- The need to reduce the cost of education.

These reasons and others have attracted hopeful politicians and others with minimal background and little previous interest to distance education. Others who view distance education as the "Trojan Horse" signaling "the commodification of higher education" have been equally moved by distance education for quite different reasons (see Noble, 1997, 1998, 1999). It is ironic that the politicians who trumpet the benefits of distance education the loudest know relatively little about it, while those who see a dark side to the use of educational technology feel quite comfortable using the Web and related media to espouse their views. Irony aside, the accompanying claims of what distance education can and can't, should and shouldn't do, have resulted in an ever-widening gap between the rhetoric and reality of distance education. Closing this gap can be accelerated by thoughtfully considering a number of key assumptions shared by many successful distance education programs:

1. **Distance education is about increasing access, not making money.** Those who look to distance education as a revenue-generating machine resulting in financial windfalls for their programs or departments are typically disappointed when they factor in the true costs of this endeavor (see Oppenheimer, 1997). These costs include hardware/software, system maintenance/upgrading, telecommunication/transmission charges, technical support, faculty/program development and evaluation, student support...and a myriad of personnel and infrastructure costs associated with these vital components and services. The importance of these critical and continuing costs and constant technological change usually necessitate the reinvestment of virtually all income generated by the enterprise. Those who take profits typically do so at the expense of needed upgrades with the potential risk of losing whatever market share they fought to win in the first place.

This is not to say that distance education is without its financial benefits. Many Land Grant institutions, for example, provide statewide educational programs and services. A few years ago, this could entail chartering aircraft to fly faculty to remote outreach or extension centers in various locations served by the Land Grant Institution. Even today, it is not unusual for faculty to drive 200-300 miles a week to meet with students located far from campus. The costs of such enterprises in terms of time, energy, and faculty goodwill are excessive.

In contrast, the appropriate use of distance education can be cost effective...even if the end result isn't a financial windfall. What does result from the appropriate use of technology may be even more beneficial: the ability to maintain and even grow the market for institutional programs and services. Given the rural and cloistered nature of many of our best Land Grant institutions, the ability to reach out to students wherever they reside is a huge competitive advantage and a potential determining factor in enhancing or even maintaining institutional viability.

2. **There is no technological "silver bullet"...not even the Web.** Every new technology is accompanied by its share of advocates proclaiming it to be the ultimate delivery tool promising to solve all instructional problems, even those that are yet to be fully understood. In reality, a poorly defined problem has an infinite number of solutions...we just never know which one is the most appropriate. Until instructional needs are understood in detail, any technology could be appropriate...or inappropriate.

Even those at the forefront of technological innovation, including Bill Gates of Microsoft and Andrew Grove of Intel, candidly admit they are unsure where the future of technology will lead their companies (Grove, 1999). As a result, they invest heavily in marketing, research, and development in efforts to maintain their technological preeminence wherever the future might lead them.

For institutions without the research and development funding to invest in every potentially beneficial instructional delivery innovation, the best advice is to avoid technological solutions in search of instructional problems. Instead, focus on the requirements of the content to be delivered, the needs of the learners being served, tangible instructional opportunities (e.g., the need to train a computer literate cadre of highly motivated professionals), and potential obstacles (e.g., limited bandwidth to the locations you serve). Attend to these requirements and the most appropriate technological solutions will make themselves apparent. In this context, the primary benefit of the Web is not as a delivery system in and of itself, but as a standardized platform from which various technological solutions can be launched.

Nevertheless, those who think the Web is the ultimate solution to all instructional problems should review the research literature of the 50s stating the same thing...about the overhead projector.

3. **The only constant in the world of instructional technology is change.** Anticipating change and technological directions is always challenging and filled with uncertainty. Move too fast and your technological upgrade will be obsolete before it is fully implemented. Move too slowly and your programmatic market share could slip before you can catch up. Just as damaging, failure to innovate will signal your competition and potential markets that your program is no longer viable.

In a world of technological change, timing is everything. Those who learn to embrace technological innovation when the timing is right will be the big winners. The rest will be left to fight over the crumbs.

4. **Lasting technological change is typically the result of evolution than revolution...**Over the past thirty years technological innovation has evolved in a fairly consistent manner. This process could be referred to as technological birth, death, and resurrection. In the "birth" stage, new technologies emerge, unrealistic expectations are set, and the potential impact of the new tool is over-hyped. In the "death" stage, the original outspoken advocates move on to the next innovation, general enthusiasm gradually fades, and interest wanes as the realities of what the new technology can and can't do emerge. Finally, in the "resurrection" stage, thoughtful reflection occurs as the new technology is tested in various, often random, instructional settings. While the technological innovation is found inadequate in most applications, it proves beneficial in addressing a limited number of very specific needs.

Over time, the once proclaimed technological cure-all takes its place among other teaching tools and fades from the forefront of technological innovation...into the hands of those who can put the benefits of the technology to best use.

It is for this reason that few effective instructional experiences are anchored to a specific technology. More often than not, a variety of technologies, each filling a specific and well defined role, are woven together by a skilled educator into instructionally sound and technologically transparent academic experiences.

5. **The emphasis of distance education should be in the quality of the academic program, not in the use of technology.** Selecting technology is easy compared to the focused attention and subtle insights needed to design, develop, and implement a truly effective academic program. This is why the skilled teacher will continue to play the preeminent role in successful academic encounters, regardless of the sophisticated technology being used.

Similarly, instructional delivery experiences that rely almost solely on technology (e.g., first generation web-based courses) with little apparent influence and day-to-day involvement by a thoughtful and skilled teacher, may generate initial student interest. Without adequate course design, there may be little lasting enthusiasm for the overall instructional program, or the motivation to complete the course that originally offered so much promise.

Finally, successful program administrators will spend adequate time and resources to nurture and support those creative and concerned faculty who are willing to take the leap of faith required to be successful in the distance education enterprise.

6. **There is no glory in managing instructional technology.** You'd think there would be, but there isn't. Keeping up with technology is a never ending battle filled with unmet expectations, too few resources, and the need to constantly plan ahead realizing that the technology that you are implementing today is likely already dated and on the road to obsolescence.

The best that can be said about the management of technology is that someone has to do it...and do it right. Without exceptional management skills and a thick skin, the implementation of technology is an impossible task that

gives those involved the illusion that they are in control, when in reality they are at the mercy of technological innovations that don't exist today, but will be demanded tomorrow.

7. **Learning is enhanced when technology is used to directly link students to other students.** The lack of effective and personalized student-student interaction and feedback is the potential "Achilles heel" of distance education. Conversely, the need for effective distant student-student interaction provides a great opportunity to creatively use technology. In fact, whether it is teacher-to-student or student-to-student interaction, learning is enhanced when technology is used to improve communication (see Flottemesch, 1999).

In my experience, effective instruction almost always requires that a fully engaged teacher establish the learning framework, even when the target audience consists of highly motivated adults. Also of critical importance is the learning that takes place when students are linked to other students...without any teacher present. Given the inherent separation that is evident in most distant learning environments, it is difficult for many students to maintain any continuing connection to the instructional context, let alone the content being presented in any given course. By creating learning spaces and technological linkages that bring distant students together as groups and as individuals, the gaps between what is being taught and what is being learned can often be bridged (see Wallace & Weiner, 1998).

8. **Face-to-face instruction is still a valid delivery method in support of distance delivered courses...when possible.** Many assume that there is no need for face-to-face instruction in distance delivered courses. After all, that is why many get involved with distance education in the first place...to avoid the "real time" constraints of face-to-face contact. In fact, some of the best distance delivered courses have well integrated components in which teachers meet directly with students, either individually, in small groups, or with the entire class. If personal interaction among the teacher and students is deemed an important course component, it is critical to meet as a group as early in the semester as possible. Experienced distance faculty report that the student comfort level in using technology increases significantly if the students and instructor meet early in the course and develop a personal working relationship.

The ideal scenario is to bring students from all sites together for an intensive day or two early in the course and incorporate group process techniques to foster cohesion and unity of purpose among participants. Ending the semester with another intensive face-to-face session at which time final projects are presented and course objectives are summarized is a beneficial capstone experience. If time and budget permit, meeting an additional time or two during the semester will likely prove both academically useful and personally rewarding.

Undoubtedly, incorporating "real time" interaction increases the logistical challenges of any distant course and requires faculty and student sacrifices as they struggle to match schedules. In some cases, however, the sacrifices are worthwhile and often essential. In the case of technical courses, for example, where laboratory experiences are critical to successful course completion, the question isn't "if" face-to-face communication can be incorporated, but "how" it will be accomplished. The challenge is then to maximize the time of faculty, facilitators, students, while scheduling the technical facilities needed to accomplish it.

Despite the potential benefits derived by focused personal contact, many educators (and even more administrators) feel that incorporating face-to-face communication in distant courses is expensive and defeats the inherent flexibility and perceived lower costs that initially attracted them to distance education.

Depending on where the course is being delivered, it may be physically impossible to bring the teacher and students together. Nevertheless, it is better to rule out personal contact as impractical or instructionally irrelevant than it is to fail considering it in the first place. When the logistics can be successfully navigated, teachers and students alike are rewarded by well-planned and highly interactive face-to-face contact.

9. **Many faculty are comfortable when distant students from other institutions take their classes, but don't like their students taking classes from faculty at other institutions.** This is a major stumbling block to cooperative distance education ventures and has limited the success of strategic partnerships relying on the sharing of faculty expertise. The best partnerships are forged when specific academic needs are identified *and* on-campus expertise is absent. In these cases, competition is not a factor and both sending and receiving institutions benefit. Despite being a major institutional and political motivator for the initial start-up of distance education efforts, true academic alliances have proven elusive and are the exception, not the rule.

Until the culture of course "ownership" moderates and the "not invented here" syndrome fades, wide scale institutional cooperation will be more a goal than a reality.

10. **At its core, distance education is a change process, not a delivery system.** Historically, higher education culture has proven resistant to change. Perhaps the greatest benefit of distance education is its potential role as a catalyst for change in the way educational institutions do business. In a relatively short span of years, the proliferation of programs and services available at a distance have resulted in a heightened sense of competitiveness unheard of in higher education. For institutions that are up to the challenge, the current interest and growth in distance learning presents a new opportunity. While the dangers of competing and failing in this new

world of educational access may pose significant problems, the refusal to aggressively move forward may be the greatest risk of all.

By any standard, distance education has proven to be a useful tool for educators and administrators who have taken the time to adequately assess its strengths and weaknesses. Continued success will require the careful planning, implementation, and tracking of distance education successes and failures.

This discussion keeps leading back to one incontrovertible conclusion: Distance education is one piece of the educational delivery puzzle, but not the "answer" to all program delivery challenges facing educators today.

There is little doubt that distance education has the potential to positively impact higher education. The greatest gains will only occur, however, after the opportunities and limitations of technology-supported delivery are critically reviewed and realistically analyzed. The sooner this happens, the better...for teachers, administrators, and most of all, the students who stand to gain the most through innovative solutions to the myriad delivery issues educators and society face today.

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Faculty Use of Blackboard For Course Instruction At Two Mid-Western Universities: A Multiple Case Study

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Abstract: The Blackboard course management system is an example of the technological advancement being used by instructors at some higher institutions. Our research is an in-depth qualitative case study exploring the perception of six instructors' use of Blackboard for course instruction. Data was collected through observations, semi-structured interviews, and a review of relevant documents with participants at two Mid-western universities. Five major themes were found to emerge from this study. The themes were: a) accessibility and flexibility, b) challenges and problems, c) training and support, d) assessment and evaluation of students' work, and e) communication and student participation. The findings demonstrate that Blackboard makes education accessible to students who are unable to attend college, and it provides flexible learning for students who are on campus. The challenges and problems of using Blackboard include a large amount of time involvement and technical problems.

Introduction

Technology is progressing rapidly and is having a direct impact on educational instruction methods. The Blackboard software platform is an example of the technological advancement being used by some instructors at institutions of higher learning. This study was limited to six instructors who use Blackboard at two Mid-western universities for course instruction.

The purpose of this case study was to explore the perception of six instructors' use of blackboard for course instruction. Data was collected through observations, semi-structured interviews, and a review of relevant documents with participants at two Mid-western universities. Blackboard is defined as a server software platform that provides a powerful environment for online teaching and learning, internet-enabled communities, and advanced integration with multiple administrative systems.

The over-arching quest was to discover how six instructors in two Mid-western Universities describe their experience of using Blackboard for course instruction. Four research questions guiding this inquiry were:

1. What is the instructor's perspective of Blackboard?
2. What are the amounts and types of technical problems?
3. To what extent does the instructor believe the learner is meeting the goals and objectives of the class?
4. What is the role of the instructor who uses Blackboard?

The significance of this study was to gain a deeper understanding of how Blackboard is being used as an instructional tool for distance courses, as a supplement to on-campus courses, and to better

understand how faculty use the program for course instruction. Gaining knowledge about instructors' use of Blackboard could help determine its usefulness as an instructional tool.

Method

We used the qualitative case study tradition. A case study is an exploration of a "bounded system" or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context (Creswell, 1998). Several features mark our project as a case study: We identify the "cases" for the study, the six instructors who are using the on-line instruction system, Blackboard; the cases are bounded by time (3-month data collection) and program (Blackboard); we situate the cases within two campuses in two Mid-western cities; and we use extensive, multiple sources of information in data collection such as direct observations, interviews, and online course documents.

The instructors participating in this study were purposefully chosen. Six instructors from two Mid-western universities were selected. A background information protocol was developed so that the participants would be able to describe their online teaching background. The participants should meet the following criteria in order to be included in our study: the participants should be from higher education institutes; the participants taught at least one course using Blackboard as an online teaching tool; and the participants used Blackboard as either a completely on-line course or as a supplementary tool.

The data were collected through six semi-structured interviews. "Interviews provide ideas filtered through the perceptions of interviewees" (Stake, 1995). All the interviews took place in the instructors' offices and were approximately 30 – 90 minutes long. Each interview was audio taped and then transcribed. We also gathered field notes by conducting observations. "Observations provide the most complete natural setting for qualitative research and they also give the researchers a first-hand experience with the informants, and the researcher can record information as it occurs" (Lincoln & Guba, 1985). Two observations were conducted in instructors' offices with the instructor and the observer as participants. One observation lasted 30 minutes; the second observation was 1 hour 45 minutes in length. The third observation was conducted in the "virtual classroom" with the instructor, two students and the observer as participants. We also collected data through a background pre-interview form that was sent to the participants by e-mail a week prior to interviews. Furthermore, the documents about the features of Blackboard and the instructors' course documents were downloaded and printed out for review and analysis.

Findings

Theme One: Accessibility and Flexibility

Can the online instruction make learning more accessible? Can online instruction provide for flexible learning? Listen to the participants as they describe their experiences.

When course content and activities are provided online, students no longer need to worry about accessing course materials. Busy students can choose to download readings or take practice exams whenever it is most convenient. Dr. Cat indicated, "With Blackboard I have all of the information for the course available in the electronic format, and available 24 hours a day, 7 days a week. That to me is an advantage." Mr. Gorilla also pointed out, "Anywhere they can get online, whether it's here on campus, downstairs in one of the computer center. I had students take the quizzes three quarter miles away across Nebraska. They have the ability to do the quizzes at midnight. Anytime they want, anywhere they want, and they can take that. That is a plus for them." Mr. Lion suggested that one of the advantages of online instruction is "the anytime, anyplace aspect that allows you to teach students whom you ordinarily would not be connect with."

On-line instruction also removes reliance on physical attendance. In traditional education, students must attend class at a predetermined time and place. Online instructions enable students to access learning without the constraints of attending class or meeting together at a certain date, time, and location. Dr. Cat posited, "What Blackboard does is to make possible for students who can't come and take traditional classes to be able to get a degree." Dr. Squirrel added, " It makes my class available to someone who would

not otherwise be able to take the class, like the student in Japan who could not take time to come to Lincoln for my class." Dr. Panther concluded, "The Internet is a good way of reaching learners who would have great difficulty in connecting with our institution through the usual on-campus learning events."

Theme Two: Challenges and Problems

Mr. Lion said, "I spend a lot of time in order to do what I want to do, trying to figure out ways to use Real Presenter and also figuring out ways to use the Internet directly into the Blackboard presentation." Time was also a major factor for Dr. Panther: "I spent my Christmas putting the course on-line... The up-front investment is important." In addition, he mentioned, "In working with eleven students, I spend a significant amount of time teaching them how to navigate on the site, how to get them logged on, talking with them on the phone, etc."

Dr. Squirrel, who has taught the same course on-campus and on-line, points out that a task such as a class presentation requires "more preparation to do that on Blackboard" than in a classroom. Dr. Cat, who was instrumental in getting Blackboard at Love University makes a strong statement about time requirements for Blackboard: "I can tell you that it took tremendous amount of time to prepare all of the information that I now make available to the students that are taking the class at the distance. For example, in the class that I teach, the statistics classes, I had to prepare approximately 27 or 28 hours of video, then edited and put on CDs, and that's a very time consuming task."

Student problems discussed by the participants include: students not being able to access Blackboard, not being able to receive attachments, unable to sign on and navigate around or get synchronous chat, and not having the necessary computer requirements to obtain the information. Mr. Lion stated, "One of the main problems was signing on" and "there were several students who had trouble getting on synchronous chat." Dr. Panther also experienced difficulty with synchronous chat and found the solution "was to go to e-mail."

Dr. Cat discussed the difficulties of taking quizzes on-line in that "if they [students] took too long working on the problem, they will be disconnected by the Internet service provider." The instructor would then have to log on and reset the quiz in order to allow the student to retake the quiz. This brought about another problem for the student: "All of the questions were lost, so they have to completely start over again. Which is real bad enough for the students and for the instructor too."

Theme Three: Training and Support

Mr. Lion stated that his first experience with Blackboard was "by searching the Internet and then I attended continuing education workshops." Mr. Lion believes his "chief challenge is to learn to use the program more effectively to make me a better instructor. We need to invest more money and time in learning to use the program by offering more workshops."

Dr. Cat believes "Blackboard is user friendly, it doesn't require a lot of support. If students have problems with Blackboard, they call the help desk. I have not really had any students that complain about the support that's been available for Blackboard." Overall, Dr. Cat finds the support for Blackboard as very good.

Mr. Gorilla has used Blackboard support when putting things on-line. When he faced problems, "the help desk has been very helpful to help me out." He has solved most of his problems through the help desk where he has found "the people that I talked to had the knowledge able to solve the problem." Although he has not gone to any meetings, Mr. Gorilla said, "I know they also have at least one once a month get together where people that have problems can go and talk and find solutions to their problems using the Blackboard."

Theme Four: Assessment and Evaluation

Learner assessments are essential in education. Effective instructors use a variety of means, some formal and others informal, to determine how much and how well their students are learning (Ridley & Husband, 1998). I will let the six instructors describe how they assess their students' performance in their own words.

Online quizzes and tests can increase motivation and provide concept reinforcement. Mr. Gorilla used quizzes as a motivation: "I use the quizzes as a motivation to have them read the chapter so that they participate." Dr. Cat used quizzes as reinforcement. He stated, " I have banks of questions which are related to the three units for the class. Students can generate a random sample of questions that were in the question bank and find out what their understanding happens to be for the content. They can do this as many times as they want. Get some practice and preparation for the exams... All these are supposed to work together so that it reinforces learning process, and it's all related to the content for the class."

The immediate feedback feature of the Blackboard assessment tools also impressed Mr. Gorilla. He remarked favorably, "Students take entire quiz online, The Blackboard grades it, and gives them a score immediately."

The two instructors who used online quizzes and exams also told us how they managed the assessment. Dr. Cat required a proctor for the exam. He stated, "They have to have a proctor who is acceptable to me and also to the division for continuing education. This person could be a school official, and not a family member. Uncles, aunts, spouses, brothers or sisters don't work." On the contrary, a proctor was not used in Mr. Gorilla's online tests. He declared, "They are not supervised. I do not use any proctor. It's not a concern of mine.... I guess I am not much concerned as long as they know the material."

The two instructors had the same style of online tests such as open-book, open- notes, and no time limit. Dr. Cat described, "The students take the exams that are open-book and open-notes. They are usually almost timed two and half-hours. They are not designed for that length of time, but I try not to have a time limit, or to speed. So they have a very comfortable amount of time to finish things." Similarly, Mr. Gorilla indicated that it was an open-book quiz and there was no time limit involved.

To evaluate performance informally, instructors also use a variety of techniques. For example, they pose questions on the Blackboard and encourage students to participate in the discussion. Dr. Panther described, "I assess student performance through the questions and discussion in the synchronous discussion... I use a lot of questions from the text that we use. I do not use tests." Mr. Lion suggested how he assessed the quality of the discussion: "I always observe the number of postings of students." Dr. Squirrel added, "I read their responses then I see how much in depth they are and I see how many times they participated.... I said to my students not only do you have to post your own idea or opinion you have to interact with other students via Blackboard."

Theme Five: Communication and Student Participation

The final theme in our research project was communication and student participation in Blackboard. The focus of this theme was to compare the quality of student communication between traditional classes and on-line classes.

Much research has been conducted to identify the benefits of the computer-assisted training and many researchers agree with the fact that "the main advantage of computer-based discussions is that all students can and usually do participate due to a low-anxiety atmosphere" (Hadley, 2001). Two of the participants, Mrs. Kangaroo and Dr. Cat indicated that Blackboard discussions help to facilitate students' participation because the system provided a low-anxiety and impersonal communication atmosphere. Mrs. Kangaroo, who used Blackboard as a supplementary device in her traditional class, said that she decided to start using it because she wanted to give shy students and students who are afraid to express their opinions in the classroom a chance to participate in classroom discussions.

According to Dr. Cat, "One of the strengths of Blackboard is the ability to be able to facilitate communication...it's somewhat impersonal because it's electronic." Dr. Panther pointed out that "on-line discussions are a fine tool to facilitate communication either in face-to-face or on-line courses."

The instructors mentioned a problem with effectively using Blackboard to communicate emotions between students and the instructor. Dr. Squirrel pointed out that she can only get "written cues from my students." She thinks that sometimes it's better to communicate emotions when you see a student face-to face: "I can't see them yawn or their facial expressions...I don't have those kinds of cues I use in my face-to-face teaching." She also noticed that she was more comfortable in person-to-person communication than in writing communication.

Dr. Cat in his interview gave advice on how to facilitate communication. He said that "one way to increase participation is to increase the amount of participation and make it part of the grade...and to grade the number of participations, or to grade the quality of way they participate."

Conclusions

We identified three groups of people that may benefit from the information provided in this study: university administrators, instructors of on-line courses, and students who take on-line courses.

University Administrators that choose to adopt a distance learning system such as Blackboard must be willing to go beyond the purchasing of the system. Financing an on-line course instruction system needs to include hiring or training qualified personnel who can provide a support network where instructors and students can call and get answers to their questions. Workshops should be offered frequently and range from basic levels of Blackboard instruction to advanced levels. Additional workshops should be provided in regard to changes and up-dates in the system.

Faculty who want to provide on-line instruction for a distance-learning course or add on-line instruction as a supplement to an on-campus course need to attend at minimum a basic workshop on Blackboard. Additional levels of Blackboard workshops are greatly encouraged, as well as attending workshops dealing with changes and up-dates in the Blackboard system. Faculty members desiring to use Blackboard must understand the time commitment involved, the up-front time of putting the materials on-line and the continuous time demand throughout the semester in working with the students. According to the majority of the participants interviewed here, the time commitment is greater for on-line courses than that of on-campus courses. Online instructors can evaluate student performance by providing assessment opportunities. You can add assessment activities to a course management system like Blackboard by incorporating practice tests, quizzes, and examinations. However, you should not rely only on online testing for grading purposes. You should have at least two other methods of evaluation, such as discussion participation and group projects.

Students who are interested in taking distance-learning courses need to find out the computer requirements, the software and hardware, as well as the desired Internet access they will need in order to participate successfully. Students should also be provided information by the university support system on how to access and maneuver throughout Blackboard courses. Online students should report to the instructor if the pace and material developed is satisfactory or indicate areas where course content needs revision or further explanation. Students' feedback can help instructors identify which teaching methods are most effective and may help instructors improve the course.

Future research needs to include information gained from at least three areas not addressed in this study: a) the students who are using Blackboard for distance learning and as a supplement to on-campus instruction, b) the staff involved with teaching Blackboard workshops and providing support to instructors and students, and c) the administrators who are involved with making decisions in regard to the Blackboard platform for course instruction at the university. Additional research needs to be conducted to look deeper into the needs of the university instructors who are teaching on-line courses. In addition, future research is needed to assess the online instruction in terms of teacher effectiveness.

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Asynchronous On-Line Discussions: Facilitating Critical Thinking Skills Within Traditional Classrooms

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Abstract: In a traditional classroom, discussions are often hindered due to limited class time and unequal access of interaction. It is difficult for instructors to monitor collaborative discussions and critical thinking. An asynchronous online forum is a promising tool to cope with this problem. This paper reports an ongoing project that examines the effects of asynchronous online forums on critical thinking and overall learning performance, and also probes students' overall perspectives toward the effect and function of using asynchronous discussion forums in the context of university courses. The research design, participants, instruments, and data analysis of this project are described.

Problem Statement and Research Objective

A primary function of education is to teach and develop critical thinking skills. In many cases this occurs through class discussions (Bloom, 1956; Newmann & Wehlage, 1993). Yet, in a traditional classroom, critical thinking usually occurs through both instructor-student interaction and peer discussion (Klinger & Connet, 1992). However, discussions may become difficult to facilitate in the following situations: 1) in classes where students have no opportunity to express their opinions because of limited class time or class size; 2) when a small number of students, such as extroverted or more eloquent students, dominate the discussion; 3) when the classroom environment is not conductive for a discussion (e.g. if the chairs or desks in the room cannot be moved); 4) if the topic is one where the students are reluctant or uncomfortable to express their views face to face. Although instructors can assign collaborative inquiry tasks to be completed outside of class time (or even during class time), it is difficult in the classroom, and impossible outside of the classroom, to monitor collaborative discussion and critical thinking. As a result, instructors can neither coach nor assess the inquiry. It is only the final product of inquiry that can be reviewed (Duffy, Dueber, & Hawley, 1998).

Asynchronous online forums (i.e., text-based computer-mediated communication tools) are promising tools that offer an opportunity for interactive discussions outside the classroom and at the same time provide an opportunity for the instructor to moderate such discussions. Some studies have compared the effectiveness of online forums to face-to-face forums; however, verbally based face-to-face forums and textually based asynchronous forums make direct comparisons difficult (Anderson & Kanuka, 1997). In essence, the core issue should be whether asynchronous discussions supplement instruction to foster critical thinking, and/or enhance overall student learning performance. In addition, while a majority of the data used for comparisons between online forums and face-to-face forums has been based on learner attitude surveys or surveys used to gain descriptive information, little data has been gathered to ascertain the differences of effectiveness on critical thinking and overall learning between the experimental groups who utilize asynchronous online forums and the control groups who do not. The question, "Are asynchronous online forums effective in higher education?" still remains largely unanswered.

The purpose of this research project is to examine the effects of asynchronous online forums on critical thinking and overall learning performance and, in addition, to probe students' overall reactions and perspectives toward the effect and function of using asynchronous discussion forums in the context of university courses.

Research Design

The research design is a pre- and post-test quasi-experimental design. The independent variable is the use of the structured asynchronous online forum. Students in the control group will only use in-class discussion

mode. In addition to in-class discussion, students in the experimental group will use a structured asynchronous online forum (threaded discussion bulletin board) as a supplement to their on-campus class where a series of discussion topics will be posted on the class Web site and facilitated by the instructor. The students taking BMS 241, an undergraduate course at Purdue University, in fall 2002 and spring 2003 will be the subjects in control group and experimental group, respectively. There are two dependent variables examined in the study: students' learning achievement and student attitude. The first dependent variable is the learning achievement of the students that is measured at two levels—acquisition of declarative knowledge and critical thinking skills. Declarative knowledge refers to the concepts, principles, issues, and facts presented in a learning situation. It is measured as the scores on the four quizzes and two exams on course content. Learning in terms of critical thinking is measured via California Critical Thinking Skills Test, class discussions on asynchronous online forums, and essay questions that go beyond declarative knowledge acquisition and involve analysis, synthesis, reasoning, interpretation, and induction. The second dependent variable is student attitude with three categories: attitudes towards asynchronous online forums, class discussion, and the course in general. Student attitude has been defined as scores on the attitude pre-and post-course Likert-type surveys developed by the researcher. The interview questionnaire will also be administered to probe student's attitude toward the study.

ANOVA will be performed to justify whether there is a difference among the subjects in terms of age, educational backgrounds, attitudes toward asynchronous forums and the course, and knowledge of content at the beginning of the class. The dependent variables, including students' learning achievement and attitudes toward the course and the asynchronous online forum, will be analyzed by using a one-way ANOVA at the end of the class. In addition, the qualitatively analytic procedure that organizes the data, generates categories, themes, and patterns, and searches for alternative explanations for the data, is adopted to analyze the data from the interview questionnaire to generalize themes regarding students' perspectives about the study. In order to pilot test the efficacy and reliability of the proposed research design, BMS 241 class in summer 2002 will be used as a pilot study for the experimental group.

Implications of Results

The importance of class discussion has been highlighted by a host of research studies; to move students beyond assimilating inert facts into generating better mental models, teachers must structure leaning experiences that highlight how new ideas can provide insights in intriguing, challenging situations (Dede, 1996). This research speculates about how an increasing important tool—asynchronous online forum, can afford educators enormous pedagogical opportunities, opportunities that could not be realized in the classroom and that may reshape traditional face-to-face education. It is our anticipation that asynchronous online forums are the means that afford students the time for thoughtful analysis, reflection, and composition as their discussion of an issue evolves and that allow instructors to mentor and evaluate the critical thinking skills exhibited during out-of-class discussions. It is this potential of asynchronous online forums that we find so exciting. However, the actual impact and effectiveness of the asynchronous forum as a supplement to on-campus instruction is still insufficiently researched. Thus, this research project will identify and experimentally examine asynchronous online forums in a constructivist paradigm, and provide useful information as to the overall reactions and perspectives of students toward the effect and function of using asynchronous discussion forums in university course delivery.

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The Evolution of Distance Learning: Distance Education, Virtual Classrooms, and Web-Based Instruction

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Abstract: Distance learning is a great tool for educators to reach traditional and non-traditional learners. Yet, like any tool, it is only useful in the hands of someone who clearly knows what it is, and how to use it. Nowadays there is considerable confusion in the use of terminology for distance education, virtual classrooms, and Web-based instruction. Two questions are frequently raised: a) what exactly are these distance learning methods, and b) is there any difference among them? This paper aims at providing answers to these questions by describing the origins, growth, technology used, as well as definitions and characteristics of each of these three instructional methods. Additionally, the similarities and differences among these teaching methods are addressed by a thorough discussion. The discussion darifies distance education and its varieties and comprehensively explains the meaning of the terminology that distance education technologies have conveyed.

Introduction

New technologies for distance education are the most rapidly changing of all technologies we deal with in our school settings. In the relatively short period of the past two decades, distance learning courses have been delivered via broadcast television, satellite distribution, and compressed video over telephone lines. Most recently, the resources and capabilities of the Internet and World Wide Web (WWW) have been utilized to support distance instruction. Accompanied with these new technologies, new terminology, such as virtual classrooms and Web-based instruction, regularly appears in the distance learning landscape. Today many educators use the same technologies, such as computers, the Internet and WWW, to deliver their distance learning courses, and interchangeably use the terms—distance education, virtual classrooms, and Web-based instruction. However, what actually are distance education, virtual classrooms, and Web-based instruction? Are the concepts of these instructional methods the same? Or are they distinctly different in some aspects? In order to answer these questions, the definitions of these three terms, as well as their origins, growth, and technology used were first examined at the outset of this paper.

Definitions of Distance Education, Virtual Classrooms and Web-Based Instruction

Distance education is now often defined as "institution-based, formal education where the learning group is separated geographically, and where interactive telecommunications systems are used to connect learners, resources, and instructors" (Simonson, Smaldino, Albright, & Zvacek, 2000, p. 20).

A virtual classroom is "a teaching and learning environment located within a mediated communication system" (Hiltz, 1994, p. 3). It is a classroom that does not exist as physical or concrete places, but exists virtually by way of the activity and the medium(a) used. For example, a virtual classroom is created when learners and instructors simultaneously see and hear each other and spontaneously interact by two-way interactive television (I-TV), a technology enabling simultaneous, two-way audio and video connections across multiple sites. However, a virtual classroom is not restricted to a synchronous learning environment. It is also created when two or more learners log into an on-line forum and discuss the course content asynchronously.

Web-based instruction is defined as "a hypermedia-based instructional program that utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (Khan, 1997, p. 6).

Origins, Growth and Technology Used

Distance Education and Virtual Classrooms

From the above definitions, it is not hard to see that technology and distance education, virtual classrooms, as well as Web-based instruction are intrinsically linked. Within the field of distance education research, there have been a number of attempts in the literature (Bates, 1993, 1995; Garrison, 1985; Keegan, 1995) to classify the relationship of technology to distance education and an effort to divide the development into what are called "three generations". According to Bates (1993, 1995), the first generation of distance education is characterized by the predominant use of a single technology, and lack of direct learner interaction with the instructor originating the instruction. Correspondence education is a typical form of first generation distance education. The second generation is characterized by a deliberate integrated multiple-media approach, with learning materials specifically designed for study at a distance, but with two-way communication still mediated by a third person (a tutor, rather than the originator of the teaching materials). Autonomous distance teaching universities are examples of second-generation distance education. The third generation of distance education is based on two-way communications media that allow for direct interaction between the instructor who originates the instruction and the remote student—and often between remote students, either individually or as groups. Third generation technologies result in a much more equal distribution of communication between student and teacher and also between students.

According to Garrison's (1985) classification, the above three generations are labeled (a) correspondence, (b) teleconferencing, and (c) computer-based. However, Garrison's attempts are not clear about why the "correspondence generation" and the "teleconferencing generation" are supposed to have ended before the "computer-based generation" begins. Keegan (1995) suggested that it be better to regard the developments in the use of technology in education as a cumulative process in which the benefits of distance education are added to conventional face-to-face provision to bring the enhancement that technology can provide. Keegan attempted to analyze educational provision from the point of view of distance education by identifying three differing structures:

> ***Conventional education*** is the normal offering of education in schools, colleges and universities today. Its characteristic structures are the dialogue, the lecture developed by the medieval universities, the tutorial and seminar, the laboratory practical the field trip and the periods of study in the library or resource center. Its characteristic technologies today are the overhead projector and the white (or black) board. With the developments of technology of the Industrial Revolution, the conventional face-to-face interpersonal provision continues, grows more widespread with the growing involvement of almost the whole population in sequential schooling for a substantial number of years (Vertecchi, 1993) and is itself enhanced by technology.
>
> ***Teaching at a distance*** can be tracked back to 150 years ago. In 1840, Sir Issac Pitman, the English inventor of shorthand, came up with an ingenious idea for delivering instruction to a potentially limitless audience: correspondence courses by mail (Matthews, 1999). However, it was not possible for instructor and learners to teach and learn in different places without the developments of technology, especially in transportation and communication, associated with the Industrial Revolution. Teaching at a distance is characterized by the separation of instructor and learner and of the learner from the learning group, with the interpersonal face-to-face communication of conventional education being replaced by an apersonal mode of communication mediated by technology. Teaching at a distance brings great benefits to the people who cannot or choose not to attend the schools, colleges or universities. However, an emotional dimension of the interaction, such as the eye-to-eye contact and interpersonal interaction, of the instructor and learners is lacking in traditional distance education.
>
> ***Teaching face-to-face at a distance*** was achieved with the telecommunications revolution of the 1980s, which associated with the deregulation of the telecommunications, the increased speed of chips and the introduction of broadband technologies. The introduction of cable and satellite technologies that can be now linked to virtual classrooms brought undreamed of new dimensions to distance education. Within the virtual classroom, the lecturer can see and hear the learners present in the class

and also all the other learners at the other sites hundreds or thousands of kilometers away. The interaction of face-to-face education has been recreated electronically and complemented the limits of apersonal interaction that traditional distance education has.

In this present phase, conventional face-to-face education in schools, colleges and universities continues and is further enhanced by the influence of the new communications techniques. In addition, many researchers consider virtual systems based on (electronically) teaching face-to-face at a distance as a new and cognate field of study to distance education.

Web-Based Instruction

As the Internet emerged since 1969 and the Web was first released onto the Internet in 1991, extraordinary growth has taken place and WWW is becoming an increasingly powerful, global, interactive, and dynamic medium for delivering instruction. Thus, the nature of the relationship between the instructor and learners continues to change as developments in technology allow them not only to communicate in various ways, but also to access and generate a wide range of resources.

The WWW, a worldwide connection of computers which enables users to easily view text, graphics, sound, and video from any computer with Internet access, allows information to be distributed worldwide, using a generic interface that can be obtained by running programs that work on various computer platforms. These characteristics empower Web-based instruction, delivered in whole or in part on the Web, to be an additional valuable tool for distance education. Like correspondence and extension courses delivered at a distance, Web-based instruction allows learners to use self-directed techniques to learn new knowledge at their own rate, and at convenient times and places. Additionally, it provides learners and instructors previously inaccessible information resources at the fingertips of them.

Web-based instruction takes many forms, from environments where only text and supporting graphics are transmitted between educator and learner, to situations where live two-way, real-time text or video interaction can take place between the educator and learner or between learners. Questions and answers must freely flow between all participants. By using interactive TV, virtual classrooms achieved the dream of teaching face-to-face at a distance to allow learner interaction that traditional distance education, such as correspondence, can't achieve. Furthermore, web-based instruction could fulfill the dream of a totally interactive virtual classroom, where questions and answers flow freely, yet the learners have immediate access to Web-based reference material to support their arguments. In addition, because WWW uses a generic interface that can be obtained by running programs that work on all learners' computer platforms, Web-based instruction does not need to require learners to travel to virtual classrooms at fixed times on fixed days to join the learning group as the virtual classrooms might need.

Because of the development of the WWW and computer-mediated communication systems (CMCS) in the 1990s, many features of virtual classroom through interactive TVs in 1980s, such as face-to-face interaction of a instructor and learners, can be fulfilled by using WWW and CMCS in this new decade. Thus, a broader definition of virtual classrooms has been redefined in 1990s by many researchers as follows:

> ***A virtual classroom*** is a computer accessible, on-line learning environment intended to fulfill many of the learning facilitation roles of a physical classroom (Clarke, 1997).

> ***A virtual classroom*** is usually based on computer groupware, or can be operated over the Internet (Matthews, 1999, p. 58).

Due to the ubiquity and popularity of the Internet—particular the WWW—most virtual classroom implementations are Web-based (Hsu, Marques, Hamza, & Alhalabi, 1999). The concept of virtual classrooms has been refocused on on-line learning environment created by computer-mediated communication systems rather than by interactive television. It does not emphasize the synchronous face-to-face interaction through I-TV; instead, it focuses more on the asynchronous on-line discussion and instruction for a instructor and learners to collaborate on the advancement of learning through technology. It seems that the new concept of virtual classroom in recent years refers to "a virtual classroom for Web-based learning" and does not have much difference from the concept of "Web-based instruction." Thus, many people use these two terms interchangeable while addressing the issues of the on-line instruction or distance education.

Discussion

New terminology, such as correspondence education, virtual classrooms, computer-based instruction, and Web-based instruction, has been created along with the Industrial Revolution, the telecommunications revolution of the 1980s, and the creation of the WWW in the 1990s. It is clear that distance education would not have been possible without the developments of technology, especially in transportation and telecommunications. The technology is ever evolving and will continue this way into the future. As the technology evolves, new terminology of distance learning will also be created.

When reflecting on whether there is a difference among distance education, virtual classrooms and Web-based instruction, our response is "Yes, there is a difference among these three teaching methods in terms of the specific technology that creates these varieties of distance education." For example, because of the telecommunications revolution in the 1980s, the instructor and learners at separate places can see and talk to each other face to face by interactive TV. The new term "virtual classroom" was thus created. Because of the creation of WWW in the 1990s that allows instructors and learners to access a wider range of resources, the term "Web-based instruction" was then created to explicate the meaning of this new instructional method for distance learning. Obviously, new terminology will continuously be coined to convey the meaning behind new teaching and learning methods that technologies have fostered. In addition, there is a strong possibility that the traditional definitions of instructional methods, such as the definition of virtual classrooms in the 1980s, will be continuously redefined to explicate the new technology. These redefined definitions might be somewhat confusing (or be used interchangeably) with the newly created ones, such as the revised definition of virtual classrooms in the 1990s vs. the definition of Web-based instruction (an example that will be explained in the discussion). However, most importantly, the purpose of these teaching methods—distance education, virtual classroom, and Web-based instruction—is undeniably the same: to improve teaching and learning at a distance by using technology.

Although new delivery technologies may provide more alternatives, greater cost savings, and increased flexibility in delivering instruction to distant learners, we should frequently remind ourselves to remain focused on instructional outcomes, not the technology of delivery. As Keegan (1995) recommended, it is better for us to regard the developments in the use of technology in education as a cumulative process in which the instructional media of distance education are continuously incorporated to the previous ones to bring the enhancement that technology can provide. With in-depth knowledge of what distance education and its varieties actually are—their characteristics, similarities and differences, we can now utilize these valuable teaching methods to provide more convenient, more accessible and better instruction for our distant learners.

Conclusion

The development of new technologies has continuously reinvigorated distance education that offers magnificent opportunities for the teaching and learning process beyond the physical limits of the traditional classroom's walls. However, in today's distance learning field there is substantial confusion in the use of terminology among distance education, virtual classrooms, and Web-based instruction. The reasons that cause this confusion are twofold: a) there is a great portion of overlapping among these teaching methods in terms of the educational technology and delivery methods used, and b) the concept of redefined traditional teaching methods, such as redefined virtual classrooms in the 1990s, might be similar to the concept of the newly created methods, such as Web-based instruction. However, it is very clear that these terms are all describing the same situation—teaching and learning at a distance using a mediated technology to facilitate the communications between the instructor, learners and resources. As distant educators, our goals are also clear—no matter which teaching methods and technologies we select, our purpose is to make improvements in both access to and the quality of distance education and to bridge the gaps between distance learning and traditional face-to-face learning environments.

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A Strategy for Analyzing On-line Communication

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Abstract: Creating equitable learning opportunities is a goal of many educators, but this is often confounded by preexisting power structures that favor some students over others. Computer-mediated communication has been hailed as a mechanism to improve education. It has been argued that participation in virtual communities can give students greater opportunities for expression of ideas. In order to fully understand this potential, on-line chat rooms can be analyzed for their capacity to create an ideal speech situation. This paper examines the theoretical basis for using virtual communication, discusses the requirements for ideal speech to occur, and examines the interactions from a virtual community.

Introduction

Technology can transform educational policy and practice, and ultimately society, when coupled with a pedagogy focusing on collaboration (Sernak & Wolfe, 1998). In recent years, the availability of technology has increased significantly, making on-line collaboration a viable option for many students. Through tools and strategies such as file exchange, electronic libraries, whiteboards, on-line debates, role-taking activities, and student dialogues, there is ample opportunity for learners to communicate with others on-line (Bonk & Cunningham, 1998). Technology, such as the chat room, offers students a level playing field where there is no immediate bias based on a person's physical attributes or traditional power roles; the essence of their thought is allowed to come through.

Understanding Dialogue

According to Habermas (1984) when people enter into a dialogue they make statements based on their objective, subjective, and normative/evaluative ideas about reality. Objective statements are based on multiple points of access whereby more one than one person has the ability to make an observation. Subjective statements are made to indicate an internal state of affairs in which the only person who has access is the person making the statement. Normative/evaluative statements are those that reflect standards agreed upon by a group of people. When making a statement, a person tacitly understands that someone else may question the validity expressed in the speech act. Should this situation arise, the speaker may need to provide reasons to support the claim. This provides a context for argumentation to take place until both parties are satisfied. All forms of communication rely on this basic framework, but in order for it to succeed, several conditions must be satisfied.

In discussing the conditions for a meaning-making event to occur, Habermas (1984) proposed the ideal speech situation. This is a theoretical standard that can be used as a basis for judging the context for communication. Ideal speech, according to Habermas, occurs in a communicative setting in which reasons can be given, discussed, and argued without the use of force. Accordingly, four conditions must be met to achieve an ideal speech situation:

- The participants have equal social status.
- All participants are equal in their autonomy and responsibility.
- The participants are willing to discuss ideas openly and are willing to receive criticism.
- There is no force or coercion, allowing the reasons to stand on their own merit.

Although this is a theoretical standard that can never be fully achieved, some situations are closer to the ideal than others.

Ideal Speech and the Classroom

Research indicates there is inequality in the classroom favoring some students over others based on attributes such as gender, class, ethnic background, race, cultural background, and sexual orientation (Banks & Banks, 1993). Given this differentiation, it is apparent that many classrooms do not approach the ideal speech situation and will be unable to transform power relations within schools to achieve a more postmodern approach to education (Aronowitz & Giroux, 1991). However, technology offers some promise in helping to level the playing field.

The ability to communicate with people electronically in chat rooms may offer students some unique opportunities to more closely approximate the ideal speech situation. Students have the opportunity to expand their identity by exploring different aspects of the self and work through problems that could not be dealt with in the "real world," (Turkle, 1995) provided they have the opportunity to come forth as individuals rather a member of a particular group.

Ideal Speech and the Chat Room

In light of Habermas's articulation of the ideal speech situation, chat rooms can be analyzed for their ability to give everyone equal status, autonomy, and responsibility. With this in place, does the force of reason carry more weight than the coercion of a more powerful person? Is the chat room a better place to discuss ideas openly and receive feedback?

In addressing these questions, excerpts from chat sessions were analyzed. The sessions were conducted as part of on-line discussions in a graduate class at a large, urban university in the southern United States. All of the participants were given pseudonyms to hide their identity. No one had any knowledge of the other participants' gender, ethnicity, or social status. Based on the analysis of the text, key areas were identified where the setting changes or controversial statements were made. The researcher identified a range of possible meanings for each of the statements and identified the validity for each. A process of pragmatic horizon analysis was used to break the meanings into those that are foregrounded and backgrounded. Meanings in the foreground are those the speaker is attempting to consciously communicate to the audience, while those that are backgrounded are not intentionally communicated but may serve as a driving force for what a person actually says (Carspecken, 1996).

In many of examples the participants were able to openly express their ideas, and the weight of their respective arguments came from their internal perspectives of the situation. Because none of the participants was aware of anything about the person other than what was revealed through their dialogue, none of them had any power over the other in the traditional sense. Many of the exchanges demonstrated a willingness to discuss reasons and ideas, rather than simply assert dogmas.

Although technology is not a panacea for all issues facing educators, it offers a new approach. Computer mediated communication has the potential to provide learners with an opportunity to grow in a community where they are judged on their ideas rather than their physical characteristics.

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